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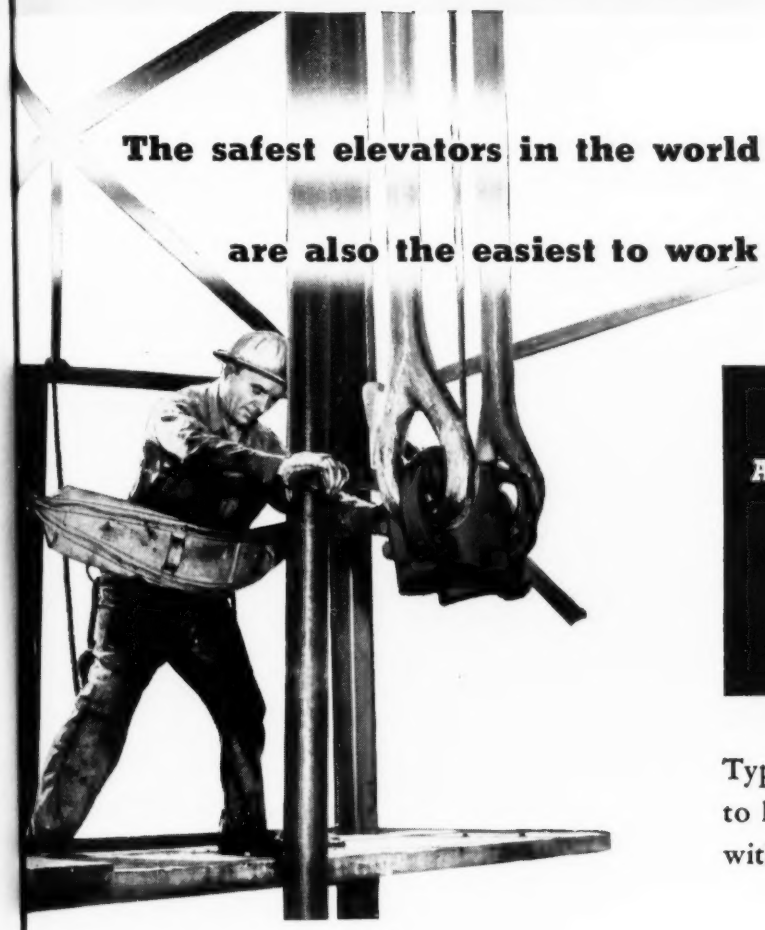

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PRICE 20 CENTS TABLE OF CONTENTS PAGE 85 **OCTOBER 19, 1946**

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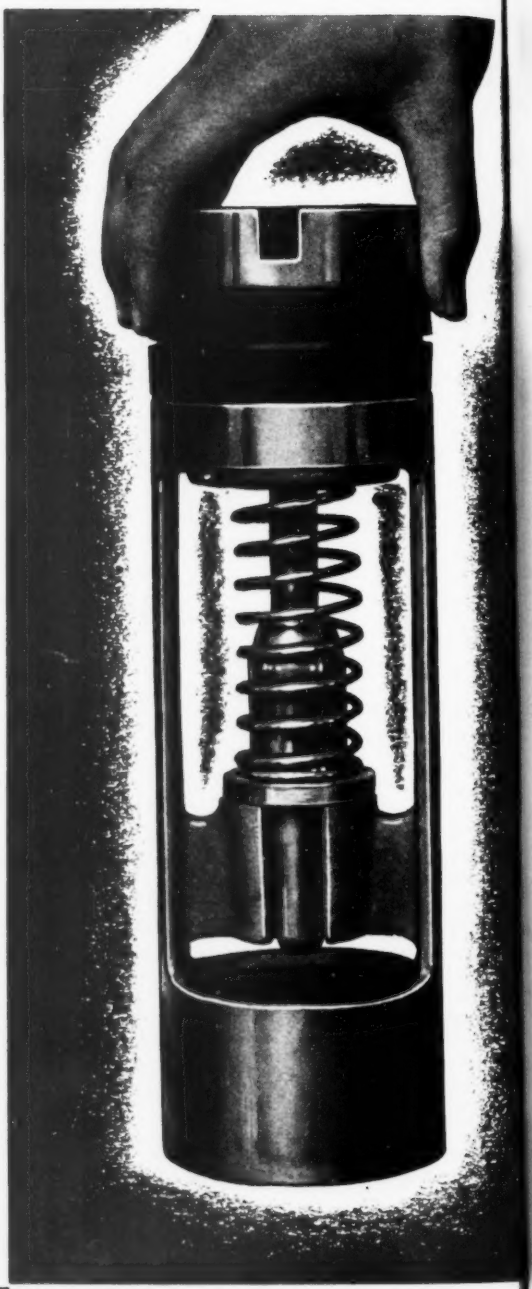

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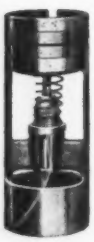

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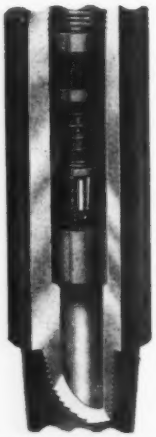
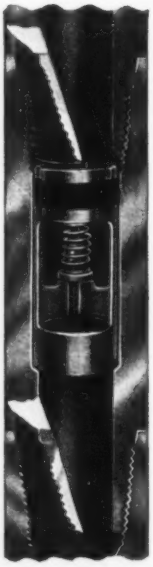


it is held in place by the tool joint pin above it. No tools or wrenches are required to install or remove.



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A Few Figures

A COMPILATION of financial and operating data by Dr. Joseph E. Pogue covering the 1945 activities of 30 oil companies reveals comparisons and trends of significance to large and small operators and their many millions of customers.

While not discussed in the report it is noteworthy that the industry has 30 major and semimajor separate and distinct units successfully carrying on operations in one or more divisions with no single concern having a dominant position in the nation's oil business. In fact, as a group these companies last year accounted for only 53 per cent of the domestic crude-oil output, 34 per cent of the wells drilled, and 80 per cent of the refinery operations. This leaves a substantial part of the industry's many and varied activities to hundreds of smaller operators, assuring further competition in a manner not duplicated elsewhere.

Outstanding are the data on today's operating costs. The 30 companies in 1945 spent 1,116 million dollars for properties, plants, and equipment, a 43 per cent increase over the average yearly expenditures in the 1935-1944 period. Included in these expenses was 107 million dollars for dry holes. Incidentally, a group of these companies spent 800 million dollars of their own money for wartime production facilities.

Getting down to individual items, the report shows that the average cost of drilling a well last year, as determined by these companies, was $69,300, a 34 per cent increase over 1944. It cost the group 575 million dollars in 1945 to drill and equip wells. As regards exploration outlays and results, the analysis estimates that in this country it cost these 30 companies 72.2 cents per barrel last year to replace existing crude-oil reserves.

While production and refining account for the principal capital expenditures of these 30 companies it is worthy of note that their investments in supporting operations have reached major proportions. Gross investments in crude-oil and product pipe lines exceed 1 billion dollars, marine facilities 391 million dollars, and among those concerns which have refineries the investment in tank cars and motor transport was 56 million dollars.

Huge earnings referred to at Washington a few months ago when petroleum price increases were being discussed do not exist, the returns on net invested capital being less than the average of manufacturing concerns. Reflecting the hazards of the business and the necessity of protecting long-range financial positions, less than 50 per cent of these net earnings last year was distributed as dividends by the 30 operators. This contrasts with the 67.2 per cent distribution for all corporations.

These are some of the vital data which explain why the petroleum industry, in these days of shortages of most commodities, is able, minus government controls, to supply all markets despite record peacetime demands and in a free economy will continue to do so.

Association Briefs Agree in Urging Curb on FPC Power

by Henry D. Ralph

WASHINGTON.—All sections of the oil and gas industries are unanimous in the view that the Natural Gas Act should be amended to restrict the jurisdiction of the Federal Power Commission to regulation of interstate trunk-line transmission and keep it out of matters involving production and gathering field prices, and end use of gas.

These views were expressed in briefs with FPC as part of its natural-gas investigation on behalf of the Natural Gas Industry Committee, American Petroleum Institute, Independent Petroleum Association of America, and Mid-Continent Oil and Gas Association.

While the four briefs approach the problem from different angles and state their conclusions in somewhat different language, there is no divergence in the purport of their requests for legislation to curb the commission's regulatory powers. All of them make the point that recent decisions of FPC and of some courts tend to enlarge the commission's jurisdiction far beyond what they say was the intent of Congress and beyond what the FPC itself formerly said was the meaning of the law.

The I.P.A.A. brief, for example, says: "If the commission does not desire this enlarged authority, a frank request to Congress, predicated upon evidence of record in this proceeding, asking that the law be restated in unmistakable clarity, would seem to be a forthright response to the duty this commission owes to the Congress."

All four associations point out that the FPC entrance into regulation of production and use, as evidenced in several recent FPC actions, is hindering expansion of the natural gas industry, interfering with field conservation practices, and raising the fear that individual oil and gas producers will become subject to detailed regulation by the commission.

The A.P.I. confined itself to four amendments it said are needed as a result of the evidence brought out during the investigation, saying:

"These clarifying amendments should be designed to insure that:

"1. The FPC has no right or power to regulate or control, directly, or indirectly, the production or gathering of natural gas.

"2. The FPC has no right or power to regulate or control the price of gas delivered or sold to an interstate pipe line.

"3. A producer or gatherer of gas shall not be classified as a natural-gas company, within the meaning of the Natural Gas Act, and hence subject to regulation as such, merely because he sells or delivers his gas directly to an interstate pipe line.

"4. The FPC shall have no right or power, directly or indirectly, to regulate the 'end use' of gas, i.e., the purpose for which a consumer may use the gas which he buys from a natural-gas company.

"This investigation has demonstrated that there are other important problems affecting those engaged in the interstate transportation of gas—problems which deserve most serious consideration by FPC in the formulation of its report to the Congress—but the foregoing matters are deemed to be vital by this intervener to the welfare of the consuming public and to that large segment of the oil and gas industry not engaged in an utility business, as ordinarily understood."

The brief for the Natural Gas Industry Committee, on the other hand, covered a much broader range of regulatory problems, discussing many of them in considerable detail. (The Oil and Gas Journal, September 28, page 54.)

Legislative History Reviewed

The Mid-Continent Oil and Gas Association's brief goes into the legislative history of the natural-gas act, the record in the FPC investigation, and various court decisions to show that Congress had no intention of giving FPC wider jurisdiction and that no federal regulation of gas production or use is necessary because state government had adequate powers to deal with these matters.

At considerable length the Mid-Continent brief argues these points: The natural-gas act does not apply to production or gathering, or sales made incident to such activities; the FPC does not have jurisdiction to regulate end use of gas; and the FPC attempt to use the public-utility rate-making formula of historical depreciated cost in fixing the price which transmission companies may pay for natural gas in the field leads to discrimination and results in regulating production and gathering contrary to the terms of the statute.

In conclusion the association's brief admits that its interpretation of the law is at variance with several recent decisions of FPC and of the courts which have extended the commission's jurisdiction into these three activities, and declares:

"We are convinced that such rulings and decisions were predicated on a misunderstanding of the intent and purpose of the Congress in passing the natural-gas act. . . . The patent conflict between what Congress said the law meant when it was enacted and what the commission and the courts now say it means, should be eliminated by clarifying legislation."

Gov. Robert S. Kerr of Oklahoma filed a brief statement with FPC summarizing the testimony he presented at the hearings a year ago.

Big-Inch Talks Hit Snag; WAA Policy Protested

WASHINGTON. — Virtual breakdown of the plans of War Assets Administration to obtain interdepartmental approval of its disposal of the two big-inch pipe lines was seen this week as the Interior Department withdrew its representatives and criticized WAA actions.

At the second meeting of the council on Monday, it is understood WAA staff men made it fairly clear they intend to recommend acceptance of the bid of Big Inch Oil, Inc., as the offer coming nearest to previous WAA policy of having the lines used for petroleum service.

Several council members objected that apparently WAA has already determined its course of action and the council was created to give a rubber-stamp approval to allay criticism, and they refused to accept this responsibility, preferring that the award follow the customary procedure of study by the established review boards within WAA. This is understood to be the reason given for withdrawal of the two Interior Department representatives, plus the objection that the procedure permits no consideration of the views of the oil industry that use of the lines for oil would disrupt the economy of a large section of the industry.

Army and Navy representatives also took this same position and further objected that WAA had misinterpreted their viewpoint, explaining that the military did not specifically favor petroleum use, particularly if it would result in reducing the size of the tanker fleet, but were concerned only in having the lines available for recapture in case of war. Federal Power Commission representatives announced that they would sit as observers only and would not participate in the final action.

Reduction of 2 Per Cent Shown In New MER for Texas Fields

DALLAS.—The Texas Railroad Commission last week released revised maximum-efficiency rates of production for Texas oil fields. Computed on the basis of testimony gathered at several hearings last summer, the new figures were approved by the state regulatory body October 7 but will not be incorporated into state allowables until November.

In spite of heavy wartime withdrawals, the study reveals that Texas' pools are capable of producing at current allowable rates efficiently and without waste.

Announcement of results of the new field study draws attention to the fact that Texas allowables in prorated fields will in the future be governed largely by their ability to produce with maximum efficiency, placing Texas production on a sound basis of conservation. During the war a subcommittee of the Petroleum Administration for War made extensive studies of reserves and maximum efficiency rates of production in Texas fields.

Data gathered was confidential, but the subcommittee made recommendations to the commission on such rates. The state will now continue this type of study and employ it as a basis for future production allowables. Although current investigations are not considered to be as thorough as those conducted by PAW, it is expected that the commission will expand its studies of fields in this respect.

Oil producers generally welcome this trend since allowables will be based on more fundamental data than in the past. Objections, therefore, are expected to be minor.

The new MER figures reflect little over-all change as compared with July allowable totals based on MER findings of 1943. In announcing the new rates, Olin Culberson, commission chairman, said "Our heavy producing fields came through the war in better condition than I had anticipated."

Culberson said it is impossible to estimate the total Texas can legally produce under the new rates, since data is lacking on a number of small fields. The East Texas field was not included in the new MER report which was prepared by the engineering department of the commission's oil and gas division under the supervision of Jack K. Baumel, chief engineer.

While the new rates indicate marked reductions in some fields of the state as compared with summer allowables, they are largely offset by higher production rates in some newly developed fields. For the total of nearly 400 reservoirs on which new rates were computed, the new rates represent a reduction of only 2 per cent allowables in the same fields in July 1946. For Districts 2, 3 and 4 covering the Gulf Coast and South Texas the reduction is about 3 per cent while in the Permian Basin new maximum efficiency rates equal July allowables.

Reductions were most consistent in the Gulf Coast where Anahuac, Conroe, North Withers, Sugarland, Stowell, and Tomball showed the greatest reductions, offset by small increases for Webster, Fairbanks, and other smaller fields.

In West Texas, Slaughter, second largest pool in the state, shows a MER of 55,000 bbl. daily as compared with July allowable of 68,067 bbl. daily, North Cowden, Foster, Seminole, and North Ward-Estes also have new rates substantially below current allowable figures, but several fields undergoing current development, including Fullerton, Keystone, TXL, and Wasson will have allowables based on a much greater MER estimate. Yates and McElroy, both settled production areas, also received MER figures in excess of their allowables.

The following table lists principal changes by districts comparing the July 1946 allowables—or old MER rates— with the new MER (figures in barrels per day):

	July	MER
DISTRICT 2 (SOUTHWEST)		
Bonnie View	2,546	2,100
South Chester	2,521	1,800
Falls City	3,603	2,700
Greta	9,888	10,500
Heyser	6,687	6,000
La Rosa	4,343	4,000
Lolita	6,958	6,000
Mayo	2,069	1,700
East Placedo	1,533	1,300
Tom O'Connor	51,575	50,000
West Ranch	25,700	22,500
DISTRICT 3 (GULF COAST)		
Anahuac	35,549	30,000
Bay City	4,288	5,100
Conroe	64,885	60,000
Fairbanks	5,786	7,500
Fannett	10,690	10,000
Gillock	4,299	2,500
Hardin	3,638	2,500
Lovell Lake	5,476	4,500
Magnet-Withers	9,024	8,000
North Markham	4,476	3,500
North Withers	13,132	7,500
Sugarland	8,040	5,000
Smith Point	2,211	3,300
Stowell	17,994	15,000
Tomball	11,626	10,000
Webster	58,658	60,000
DISTRICT 4 (SOUTHWEST)		
Colorado	2,178	5,000
Flour Bluff	2,690	5,000
Plymouth	9,272	10,600
Taft	2,538	3,000
East White Point	10,000	12,000
Willamar	15,224	16,000
DISTRICT 5 (EAST CENTRAL)		
Pickton	2,311	1,200
Van	35,188	30,000
DISTRICT 6 (EASTERN)		
Hawkins	46,168	45,000
Talco	24,658	25,000
DISTRICT 7B (WEST CENTRAL)		
Wimberly	4,513	5,190
Reddin	2,018	2,400
DISTRICT 7C (WEST CENTRAL)		
Todd (deep)	7,243	9,500
DISTRICT 8 (WEST TEXAS)		
Block 31 (Devonian)	2,518	3,060
North Cowden	40,130	25,920
Emma	3,336	2,600
Emperor	1,346	2,000
Fort Stockton	1,455	840
Foster	27,183	16,744
Furhman-Mascho	6,433	5,000
Fullerton (Clear Fork)	27,008	28,140
Fullerton (Ellen)	420	*1,500
Goldsmith	27,125	25,000
Johnson	4,453	2,900
Jordan	9,698	6,600
Keystone (Ellen)	41,547	50,000
Keystone (Holt)	3,228	4,400
Mabee	4,192	2,900
McElroy	31,242	35,000
Monahans (Permian)	40	3,000
McKnight-Sandhills	539	2,000
Seminole	25,014	22,000
Slaughter	68,067	55,000
TXL (Devonian)	9,038	13,800
TXL (Ellenburger)	6,280	†16,450
Waddell	5,130	3,000
North Ward-Estes	15,936	12,000
Wasson	66,314	78,000
Welch	4,710	2,760
Wheeler (Ellen)	2,645	3,250
Yates	42,009	50,000
DISTRICT 9 (NORTH TEXAS)		
Ringgold	1,959	1,500
KMA	17,919	16,000
KMA (Ellenburger)	7,816	6,000
Murray (Ellen)	801	1,125
DISTRICT 10 (PANHANDLE)		
Bateman	831	1,225
Ross Ranch	715	1,200

*Plus 500 bbl. for each new well.
†Plus 350 bbl. for each new well.

Socony-Vacuum Opens Norfolk, Va., Terminal

NEW YORK.—A new marine terminal of Socony-Vacuum Oil Co., Inc., was opened in Norfolk, Va., recently with the arrival of the company's tanker Siwanoy bringing in the first shipment of petroleum products to the plant.

The Siwanoy's cargo consisted of gasoline and fuel oil from the company's refinery at Beaumont, Tex. Located on a 25-acre tract on the Elizabeth River opposite the Norfolk Naval shipyard, the terminal's five tanks provide a storage capacity of 13,080,000 gal.

Construction of the plant was begun several months ago to meet Socony-Vacuum's needs in the Virginia area. The new terminal has facilities to receive shipments from ocean-going tankers and to make out-shipments by barge, tank car, and tank truck.

Government Maps Emergency Plan To Meet Tank-Car Shortage

WASHINGTON. — An emergency program to relieve the shortage of high-pressure tank cars for shipping liquefied petroleum gas has been undertaken by the Office of War Mobilization and Reconversion, following strong protests from L.P.G. shippers against the original program of transferring government-owned cars from L.P.G. to liquid-ammonia service.

The program covers both high-pressure cars and low-pressure cars specially designed for acids and other chemicals, and involves speeding construction of new cars, faster turn-around and more efficient routing of existing cars, and some modification of the diversion program.

The pressure tank car committee of the National Petroleum Council met 3 days here last week and conferred with several government officials but will not submit a report until checking statistics on number of cars actually needed for liquefied gas use.

Meanwhile, the Office of Defense Transportation is preparing a plan, as directed by OWMR, for reallocation of pressure cars among the various L.P.G., fertilizer, and chemical users, and is expected to have a report by the end of this week indicating whether more cars will be diverted from L.P.G. use before new cars are manufactured.

The OWMR announcement said:

"The War Department, the Civilian Production Administration, the Office of Defense Transportation, and the War Assets Administration jointly developed an emergency program under which the following steps are being taken:

"1. The Office of Defense Transportation will locate 525 petroleum tank cars which can be converted into ammonium nitrate solution carriers. About 300 of these cars will be leased to the War Department and the remainder will replace War Department-owned cars which will be recalled from industry service.

"2. The War Department has canceled its plans for immediate recall of 400 sulfuric acid tank cars now on lease to industrial concerns. However, about 100 of these cars, now in the ammonium nitrate solution service, and 200 other Army-owned chemical carriers, will be withdrawn as quickly as ODT assigns petroleum cars for conversion into ammonium nitrate carriers. The converted cars will have greater carrying capacity than those they replace.

"3. CPA is taking necessary actions to step up production of high pressure tank cars which are critically short of requirements.

"4. WAA will refrain from further sales of high-pressure cars normally used in the transportation of anhydrous ammonia, propane, butane, and similar chemicals until the present emergency has passed.

"5. The ODT will take such actions as are necessary to increase the efficiency of use of existing high-pressure cars by eliminating cross-hauls, speeding turn-around time, or other means.

"6. ODT will use its powers to insure that Army-owned high-pressure cars which are withdrawn from commercial fertilizer production are replaced by other cars, preferably from new production, but from other sources if necessary.

"7. ODT also will make special efforts to replace cars withdrawn from the L.P.G. industries, either for the Army or for commercial fertilizer plants, as rapidly as production of new high-pressure cars will permit."

Shell Unit Uses Microspheroid Catalyst

HOUSTON.—A new catalytic-cracking unit, first to use microspheroidal catalyst, was dedicated last week by Shell Oil Co., Inc., at its Houston refinery in a program at which James H. Doolittle, Shell Union Oil Corp. vice president, was the principal speaker.

The new catalyst to be used in the unit is expected to minimize catalyst loss. When in full operation, the unit will process some 22,000 bbl. daily of petroleum products, including light fractions used in refinery processes and in the manufacture of petroleum chemicals at Shell Chemical Corp.'s nearby plant.

Doolittle told the dedication audience that "aviation-gasoline sales will double in the next 2 years and will be three times present sales by 1950." Despite developments in jet engines, the noted wartime Air Forces general said aviation gasoline will continue in use for some years to come. "While gas turbines will undoubtedly replace the reciprocating gasoline engines in aircraft at some future time, this transition will be very gradual," he added.

C. E. Davis, New York, Shell Oil vice president in charge of manufacturing, discussed the new catalytic unit. The catalytic cracker, he said, was designed originally by the company's research and development department, and design of equipment and processing units was done by the three contracting firms: Fluor Corp., Ltd., Kansas City, Mo.; Foster Wheeler Corp., New York; and C. F. Braun & Co., Inc., Alhambra, Calif. Davis also sketched the refinery's growth in less than 20 years, from a daily throughput of 30,000 bbl. in 1929 to its present rate of 81,000 bbl. a day.

Construction of the new unit was started in 1945 and was originally intended to serve as part of the company's wartime aviation-gasoline program. Gases produced by the unit as an important byproduct for operations in Shell Chemical's plant include many which in former days would have been flared and wasted, Shell officials said.

Air-conditioning, indirect lighting, sound proofing, bright-colored tiles, pastel shades on the wall, are features of the refinery control rooms located at the base of Shell Oil Co.'s new catalytic-cracking unit at its Houston refinery

THIS 1946 WEEK

S M T W T F S

EXPANSIONS— Shell opens new cracking unit, first to use microspheroidal catalyst, in Houston. . . . Several thousand Shell employes at dedication ceremonies hear Shell officials speak of $25,000,000 program to make Deer Park refinery one of world's largest chemical plants with output exceeding total of Shell's four Pacific Coast plants. . . . ¶Indiana Standard's new fluid catalytic-cracking unit, one of largest of its type, goes on stream. . . . Unit's throughput of 20,000 bbl. will increase Whiting refinery capacity to nearly 150,000 bbl. daily. . . . ¶British American Oil discloses refinery planned in Vancouver area as soon as materials and equipment are available. . . . ¶Carthage Hydrocol signs contract with Navigation District officials at Brownsville, Tex., leading to construction of gasoline-synthesis plant starting next spring. . . . ¶Southern Natural Gas seeks FPC permission for extensions involving 138 miles of 20 and 22-in. lines, new compressors, and designed to boost system capacity by 50,000,000 cu. ft. daily. . . . ¶Formation of a new company in Phoenix, Ariz., to build West Texas-Phoenix crude line and refinery in Phoenix reported. . . . Cost of project placed at $10,000,000. . . .

PRODUCTION—Texas Railroad Commission announces revised M.E.R. . . . New rates show 2 per cent reduction from previous M.E.R.'s which were represented in record-high allowables last July. . . . ¶Texas crude purchasers expected to ask 100,000 bbl. daily more crude at November allowable hearing this week. . . .

THE GOVERNMENT— R. H. Colley, Atlantic Refining president, quits National Petroleum Council. . . . Asserts legal curbs prevent effective action and that peacetime operations require individual, not group, decisions. . . . Resignation considered another sign of flagging interest in organization. . . . ¶OWMR announces series of steps to meet pressure tank car shortage. . . . Despite action situation expected to continue critical through rest of this year. . . . ¶OPA suspends price control on minor petroleum products, primarily with asphalt and wax base, not included under mandatory congressional-ordered petroleum decontrol. . . .

REGULATION— Texas Railroad Commission postpones until November 15 effective day of "model" proration order for Stratton field. . . . Southern Minerals Corp., in asking delay, says new $1,000,000 gasoline absorption plant will be ready to operate by mid-November. . . . Oil producers criticize order, contending volumetric-displacement formula would allow excessive gas withdrawal and cut oil production 50 per cent. . . . ¶U. S. Bureau of Land Management promises final draft of new public-land leasing regulations by November 15. . . . ¶Texas Railroad Commission asks new Oil and Gas Statistical Division in budget submitted to state Board of Control. . . . Increased funds for other commission activities sought. . . .

INTERNATIONAL— Iraq Petroleum discloses wildcatting program in Palestine with operations due to start with arrival of equipment from the United States. . . . ¶June output of Anglo-Iranian shows slight drop to about 383,000 bbl. daily. . . . ¶August production of Creole, world's largest producer, hits 581,519 bbl. daily. . . . ¶Insufficiency of Cie. Francaise des Petroles' approximately 20,000-bbl. daily share of Iraq production seen as reason for new contract under which French company will take about 16,000 bbl. daily of Venezuelan crude from Pantepec. . . .

Oil activity in the sparsely settled Uinta basin of Northwest Colorado and Northeast Utah is booming in spite of problems somewhat akin to those of foreign operations. The picture shows a camp in the Rangely field, 100 miles from electric-power lines, using trailers for houses and a diesel-powered generator. This scene is apt to be repeated many times if the new Weber sand prospect at Elk Springs, 28 miles northeast of Rangely, proves up. Continental Oil Co. 1 Smith, SW SE SW 30-5n-98w, on drill-stem tests around 6,100 ft. looks very good, with geological conditions remarkably similar to those at Rangely. More than 3,000,000 acres are under lease in the Uinta basin, and extensive geological and geophysical work has been done. Carter Oil Co. is now drilling a wildcat 60 miles west of Elk Springs, across the line in Utah. (Photograph, courtesy of Caterpillar Tractor Co.)

New Indiana Standard Catalytic Unit Goes on Stream in Whiting

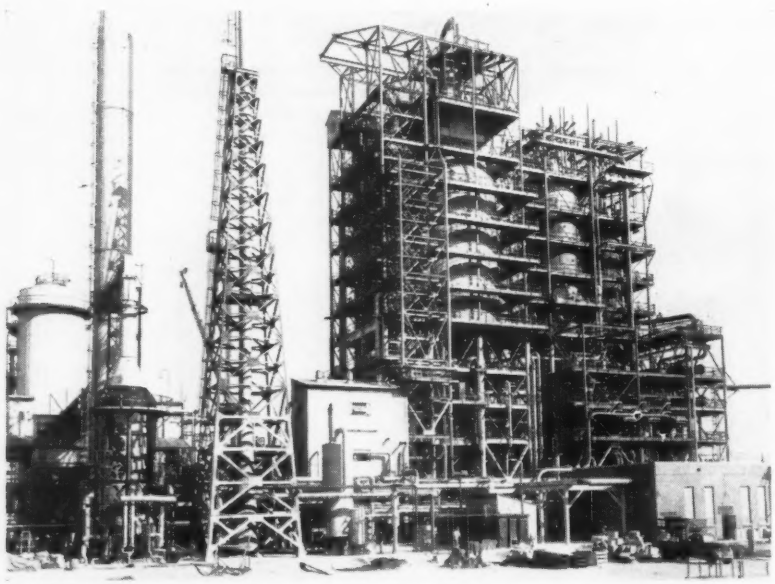
CHICAGO.—Starting operations recently at the Whiting, Ind., refinery of Standard Oil Co. (Ind.) is a new fluid catalytic-cracking unit, one of the largest of its type ever put on stream.

The unit's throughput increased the total crude capacity of the refinery to nearly 150,000 bbl. per day, according to A. W. Peake, Indiana Standard's president. It is one of the largest of the postwar-designed fluid units, embodying the most recent advances in catalytic-cracking technology.

Designed for a throughput of mixed gas oils of 20,000 bbl. per day at a conversion rate of about 55 per cent, the plant is now processing about 25,000 bbl. per day of gas oils from high-sulfur West Texas crudes. The reactor is operated at about 910° F. and slightly above atmospheric pressure, with a catalyst-oil ratio of 6.8 to 1. The unit is designed to burn 16,000 lb., or 8 tons, of catalyst carbon per hour, and uses 5,400-hp. compressor capacity to supply 3,000,000 cu. ft. of air for the operation.

Because of the high-sulfur stock considerable amounts of alloy steels are used in the plant. Lines are alloy-lined; the reactor is lined or clad with corrosion-resistant alloy. Bubble trays in the tower are 18 in number, of pressed alloy steel; the fractionator is lined with a 7/64-in. sheet of stainless steel. The size of the unit can be visualized somewhat by the fact it is 16 stories high, its reactor 50 ft. high and its main fractionator, 108 ft. high by 16 ft. 2 in. in diameter.

Personnel to operate the huge unit had been trained thoroughly in operating technique before the cracker went on stream. Construction of the unit is part of the company's $150,000,000 expansion program; a second catalytic unit is to be built in Whiting; one is under construction at Sugar Creek, Mo.; one is planned for Casper, Wyo.; and one is already operating at Wood River, Ill. The new research laboratories of the company covering two city blocks will be completed in 1947.



The first of four catalytic crackers planned by Standard Oil Co. (Ind.) in its $150,000,000 construction and expansion program, this new fluid unit has gone on stream at the company's Whiting refinery

P.E.S.A. Names Safford As Executive Secretary

H. R. Safford, Jr., Houston, has been appointed executive secretary of the Petroleum Equipment Suppliers Association, it was announced last week by Hugh H. Glen, president of the association.

Safford, a resident of Houston since 1924, is a former vice president of Ritchie-Safford, Inc., advertising agency, and has been active in public-relations activities and civic-committee work in Houston. He recently returned from approximately 4 years' service with the Army Ordnance Department, during which he was a counterintelligence officer. Safford was discharged in April with the rank of major.

H. R. SAFFORD, JR.

The new executive secretary was selected by a committee consisting of the directors of the association. He will be charged with coordinating the activities and interests of the association; serving as liaison between various committees, and committee members, making all arrangements for the annual and regional meetings, and generally handling the affairs of the organization.

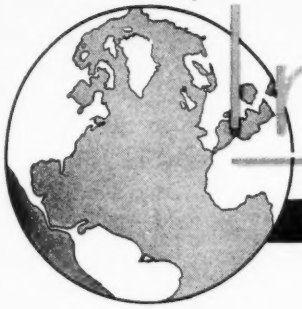
Atlantic Refining, Sun Oil Buy Government Tankers

Purchase from the U. S. Maritime Commission of two large, high-speed tankers by Atlantic Refining Co. and three by Sun Oil Co. is announced.

The two vessels acquired by Atlantic have a deadweight tonnage of 16,600 tons, speed of 14.5 knots, and a carrying capacity of 141,000 bbl. of gasoline each. They will be placed in service immediately.

Only one of the three tankers purchased by Sun has been delivered, but with the completion of necessary work on the other two, it is expected they should be in service within a month. Two of the new Sun vessels have a carrying capacity of 141,153 bbl. of gasoline and a rated speed of 14.5 knots, while the third is larger and develops 15.5 knots.

With acquisition of the ships, Atlantic's fleet numbers 16 tankers totaling 250,000 tons. The Sun fleet now has 17 ships totaling 249,740 tons, and has replaced all war shipping losses of the company.



International

WORLD-WIDE OIL DEVELOPMENTS

French Company to Get Initially 16,000 Bbl. Daily of Pantepec Oil

by Warren W. Burns

NEW YORK.—On January 1, 1947, Cie. de Francaise des Petroles, which is 35 per cent owned by French Government, is slated to start lifting about 16,000 bbl. daily of Venezuelan crude oil from Pantepec Oil Co. of Venezuela, S. A.

The contract will run for 3 years. Initial announcement of the agreement was made last week. (The Oil and Gas Journal, October 12, page 61).

Compagnie Francaise des Petroles is a 23.75 per cent partner in Iraq Petroleum Co., Ltd., and currently is getting about 20,000 bbl. daily from Iraq's Kirkuk field daily output of which is around 85,000 bbl. However, the French company's share is insufficient to run this company's two refineries in France, which are located at Martigues, near the Mediterranean coast, and at Gonfreville, near Le Havre.

The Martigues refinery is running 20,000 bbl. daily of crude and the Gonfreville plant—which was badly damaged during the war—is running at about one-fourth of its prewar capacity which was 30,000 bbl. daily. With the 5 per cent of Iraq Petroleum's crude which accrues to C. S. Gulbenkian, minority shareholder in Iraq Petroleum, and which Compagnie Francaise buys, the French company is still short from 7,000 to 10,000 bbl. of crude daily.

The other partners in Iraq Petroleum which each get 23.75 per cent of the Iraq crude are D'Arcy Exploration Co., Ltd., a subsidiary of Anglo-Iranian Petroleum Co., Ltd.; Anglo-Saxon Petroleum Co., Ltd., a Royal Dutch-Shell subsidiary; and the Near East Development Co., jointly owned by Socony-Vacuum Oil Co. and Standard Oil Co. (N. J.).

Petroleum consumption in France for the first 6 months of 1946 follows:

	Tons	Bbl.
Gasoline	582,000	4,074,000
Kerosene	44,000	308,000
Lubricants	98,000	686,000
Gas oil	180,000	1,260,000
Fuel oil (bunkers)	54,000	378,000
Fuel oil (other)	438,000	3,076,000
Asphalt	148,000	1,036,000
Total	1,543,000	10,801,000

Creole Petroleum Corp. has a joint interest, and is the operator, in Pantepec properties located in the Venezuelan states of Anzoategui and Monagas. About 5,000 bbl. daily is being produced from El Roble field in Anzoategui, and Mulata field in Monoagas accounts for 27,000 bbl. daily. Half—16,000 bbl.—is Pantepec's share. Another 300 bbl. is curently being produced from TR and TR-N fields in Monagas. The TR and TR-N fields are extensions of Temblador field.

Accelerated Drilling Program

With an accelerated drilling program under way, it is expected that Creole-Pantepec properties will be producing about 35,000 bbl. in another year. Creole reportedly will continue buying Pantepec's share of crude until the end of this year when the contract expires.

The Venezuelan Atlantic Refining Co. has an agreement to drill six exploratory wells, before March 31, 1947, on Pantepec's wholly owned concessions in eastern Venezuela, an area of about 326,000 acres. This is the Trital block in Monagas. One small well, 1 Avipa, near Mulata field, is currently producing about 150 bbl. daily.

Atlantic also has under option 307,000 acres in Anzoategui, Monagas and Guarico. Currently, three deep tests—one in each state—are being drilled. Projected depth of these wells is 8,000 ft., with average depths now averaging 7,000 ft.

Cie. Francaise des Petroles will pay for the crude at a price based on posted prices of similar crudes in the Texas Gulf Coast. Crude from El Roble field is of a 54-55° A.P.I. gravity, and 33-34° A.P.I. gravity in Mulata field.

Under a separate contract, the French company agrees to pay to Pantepec 50 per cent of Pantepec's cost of 25 wells in El Roble and 50 wells in Mulata, estimated for purposes of the contract, at $4,375,000. The money is to be paid in over the 3-year period as wells are drilled, William F. Buckley, chairman of a Pantepec stockholders' committee, said.

The French company also obtained an option for a 3-year period, or whatever time required for the completion of the 75 wells—whichever is the longer—to acquire half of Pantepec's half interest in Pantepec-Creole and Pantepec-Atlantic contracts, and 25,000 of a total of 100,000 shares of common stock of a Florida company which will own, through a subsidiary, in excess of 4,000,000 acres of oil and gas leases in that state.

The purchase price for acquisition of this half interest in Pantepec's Venezuelan position and one-fourth of the common stock of the Florida company is the value at the time payments are made of 20,000,000 bbl. of El Roble crude and 20,000,000 bbl. of Mulata crude. The average price of these crudes is now in excess of $1.50 per barrel.

If Compagnie Francaise fails to exercise the option, or to transfer it, it will forfeit the right to the $4,375,000 well costs, Buckley explained.

U.S.-Arabia Plane Planned

NEW YORK. — Arabian American Oil Co., a jointly owned subsidiary of Standard Oil Co. of California and The Texas Co., is reported planning to buy a DC-4 plane to carry its personnel between the United States and the company's properties in the Persian Gulf area. Company studies have shown the savings in fares will pay for the airplane investment in about 2 years.

International

WORLD-WIDE OIL DEVELOPMENTS

Russians Balk Again On Austrian Oil Claim

VIENNA.—Another snag in the settlement of Russia's debt to American oil interests in Austria was struck last week when the Soviet mineral oil administration flatly refused to pay $1,500,000—which had been previously agreed on—until it receives a detailed financial statement on the operations of American-owned oil properties here.

The Austrian oil properties, chiefly owned by American and British interests, have been used by the Soviet since the end of hostilities. While receipts from the oil sold should have been turned over to the proper owners September 24 in accordance with a formal agreement, Russian officials raised another barrier.

The first barrier, looked upon as a particularly peculiar one by Allied interests was, nevertheless, complied with. It called for a report on crude-oil receipts; receipts on production and finished products; number of regular working hours put in by employes; number of hours worked overtime; and number of employes and their salaries.

September 24, the date on which payments were to have been made, the Russians called for a complete financial analysis of American oil operations here. The Americans refused to comply, holding that such a report involved confidential business information and, moreover, that such information had no relation to Russian payment for products already delivered.

Victor Barry, spokesman for the American oil interests in Austria, stated that the general manager of Soviet Mineral Oil Administration, previously promised that confidential business information—such as is now being requested—would not be demanded, but that this promise has been "brazenly repudiated." Moreover, the Soviet commander in Austria told Gen. Mark Clark last June that instructions had been issued to pay outstanding debts to American oil interests, which at that time amounted to about $900,000. However, the Russians appeared with only $80,000.

Another sore point, insofar as American oil interests in Austria are concerned, is Russia's demand that over 100 armed "partisan guards"—Austrian Communists—be paid regular salaries.

The operation of Austria's Zisterdorf oil fields, and other Allied oil properties, by the Russians, combined with Russia's refusal to recognize Austria's right to nationalize the oil industry, has resulted in a resolution asking the United Nations to receive an Austrian delegation which would present the entire problem before this group for a peaceful solution.

I.P.C. Waits Equipment for Palestine Wildcat Program

GAZA, Palestine.—As soon as the necessary drilling equipment can be obtained, Iraq Petroleum Co., Ltd., expects to commence wildcat operations near here. The equipment is on order in the United States.

Concessions along the entire coastal plain of Palestine from the Sinai peninsula to the Syrian border have been obtained by Iraq Petroleum, officials said.

Colon Production Drops

CARACAS. — Production of Colon Development Co., Ltd. (Shell) for the 4 weeks ending September 30 was 405,994 bbl. (14,496 bbl. daily), compared to a total production of 523,073 bbl. for the 5 weeks ending September 2 (14,944 bbl. daily). Colon's highest production for any single 5-week period this year was the one ending February 4 when the total was 624,910 bbl. (17,850 bbl. daily).

Creole's August Output At 581,519 Bbl. Daily

NEW YORK.—A slight gain in production of over 1,000 bbl. daily was reached by Creole Petroleum Corp. in Venezuela during August when the company's daily average reached 581,519 bbl., compared with 580,053 bbl. daily for July.

Twenty-three wells were brought in during August, with no dry holes or gas wells, compared with 20 completions during July with one dry hole and one gas well. Three of the August completions were exploratory, and two of the three were in the Mulata field with a combined average initial production of 185 bbl. Average depth of these two wells was 5,218 ft. The other exploratory well was brought in at San Joaquin with an average initial production of 760 bbl., its depth being 7,367 ft.

The average daily refinery output for August was 58,504 bbl. compared with 68,300 bbl. for July. The daily average output for August was divided between Caripito, with 48,780 bbl., and La Salina with 9,724 bbl.

Of the 20 development wells for August, the fields where these wells came in, their average initial production and depth follows: B.C.F. (Bolivar Coastal), nine, 1,103 bbl., 3,037 ft.; Jusepin, eight, 546 bbl., 4,937 ft.; Mulata, one, 323 bbl., 6,127 ft.; Quiriquire, one, 1,176 bbl., 3,540 ft.; and San Joaquin, one, 249, bbl., 5,266 ft.

Iranian Production at 383,366 Bbl. Daily in June

LONDON. — Total Iranian crude production during June amounted to 1,643,000 tons (about 11,501,000 bbl. or 383,366 bbl. daily), according to the Anglo-Iranian Oil Co., Ltd., the only producing company in Iran. The June total compares with May's output of 1,775,000 tons (about 12,285,000 bbl. or 396,290 bbl. daily).

Total production for the January 1 to June 30 period, this year, was 9,925,000 tons (about 69,475,000 bbl. or 383,834 bbl. daily). While no figures are available for comparison, during the first 6 months of 1945, total production for the first 3 months of 1946 was 4,784,000 tons (about 33,488,000 bbl. or 372,088 bbl. daily).

Russians Report Drilling Europe's Deepest Well

MOSCOW.—According to the Moscow Radio, Russian oil drillers have completed the deepest well in Europe. The well, located on the Apsheron peninsula near Baku, reportedly reached 4,000 m. (about 12,800 ft.)

Moscow Radio also has stated that large oil deposits estimated at "millions of tons" have been discovered in Tartar, autonomous Socialist Soviet Republic. Three wells were said to be in production.

Guadalajara Bulk Station Destroyed by Fire

GUADALAJARA, Mexico. — The bulk station of Petroleos Mexicanos here recently was destroyed in a fire reportedly due to an electrical short circuit. One person was burned to death, and six seriously injured. Losses of equipment and stored products was estimated at about $450,000. Although the equipment and products were not insured, Petroleos Mexicanos has a special fund for such accidents.

Russia Reported Building New Oil Center at Baku

LONDON.—According to reports received here, Russia is building a new oil center to be known as Sumgait, at Baku field on the Caspian Sea. Anticipated population of the new city is 50,000. Industrial establishments will include a pipe-rolling factory to serve as the Baku field's main source of supply. Location of the city is in Russian Azerbaijan, north of the Persian territory of the same name.

The Abu Roash well, named for the little knoll upon which it is situated, was begun in January 1946 by Standard Oil Co. of Egypt, S. A., an affiliate of Standard Oil Co. (N. J.) Photo shows a general view of the well with the pyramids in the background. The well is about 4 miles west of the pyramids. The well struck granite at 6,250 ft. Total depth, 6,289 ft. The well will probably be abandoned after complete tests are made

"Cradle of Civilization" Scene of Oil Search by Standard of Egypt

by Warren W. Burns

WITH three diesel-powered rigs currently being run on wildcat ventures in Egypt by Standard Oil Co. of Egypt, S.A., an affiliate of Standard Oil Co. (N. J.), geologists are seeking evidences of oil in sedimentary deposits laid down by ancient seas.

Highlighting extensive explorations —made particularly hazardous in the Western Desert section by the existence of tens of thousands of land mines planted by the Allies and Nazis during the last war—the Abu Roash well, located less than 10 miles west of Cairo, has perhaps attracted the most attention.

The Abu Roash well is part of Egyptian Standard's drilling program to test the oil potentialities of almost 6,000,000 acres of land held on exploration permit from the Egyptian Government.

Long regarded as a possible source of petroleum, the "Cradle of Civilization" is just one of the many remote areas where costly exploration is being carried on. Geological and geophysical surveys were interrupted by wartime military operations in North Africa, but technicians now are pushing their search into hitherto unexplored areas of the vast desert.

Surface geological surveys covering wide areas of Egypt's Western Desert region, substantiated by gravity-meter and magnetometer tests, confirmed the presence of a large and potentially favorable oil-bearing formation close to the site of the famous pyramids. The best location for an exploration well to test this structure was fixed at a point about 4 miles west of the pyramid of Cheops.

Late in September, indications were that the Abu Roash bit had struck granite at 6,250 ft. The well probably will be abandoned after complete tests have been made. Total depth of the well was 6,289 ft. This drilling was regarded as a "crucial test to determine whether oil might be found in this vicinity." If a commercial well had been brought in, Egyptian Standard officials pointed out that it would have been unique in at least one respect as Cairo street-car lines run to within 4 miles of the well site.

Abu Roash is located 225 km. (about 140 miles) northeast of Ras Gharib, Anglo-Egyptian Oilfields, Ltd.'s (Royal Dutch-Shell) field which is currently producing about 25,000 bbl. daily. The only other commercial field in Egypt is Anglo-Egyptian's Hurghada field with a daily output of around 1,400 bbl., a field which is nearing the end of its commercial operation.

Early this year, Anglo-Egyptian, in partnership with Socony-Vacuum Oil Co., Inc., brought in a wildcat at Sudr, about 40 miles south of Suez on the east coast of the Sinai Peninsula. The test well indicated a daily production of 275 bbl. of 22°-A.P.I.-gravity crude. A second well

is now being drilled, and late in September, reports were that it was down around 3,000 ft. when mechanical difficulties were encountered. It is projected as a deep test. Sudr is located 150 km. (about 93 miles) east and slightly south of Cairo.

Other wildcats being drilled by Egyptian Standard are El Khabra, located on the Sinai Palestine frontier and Wadi Baba, on the Sinai side of Gulf of Suez.

El Khabra, on September 3, was down to 5,890 ft., and had encountered fossiliferous limestone, probably Jurassic. Wadi Baba, on the same date, was down to 4,548 ft. in hard dark gray to greenish gray mica schist. If Wadi Baba turns out to be a dry hole —as present conditions indicate—the rig will be moved to Ras Abu Rudeis, 9 km. due west of Wadi Baba.

In stressing the difficulty encountered in Egypt's Western Desert, due to the land mines, an oil-company official explained that due to the dry atmosphere these mines almost never deteriorate. With the aid of government employes, however, the dangerous and expensive clearance is effected before survey parties enter any particular area.

Currently, Egyptian Standard has three geological parties in this country, one gravity-meter party, and one seismograph party which is experimental and which is being jointly financed by Egyptian Standard, Anglo-Egyptian Oilfields, and Socony-Vacuum. Seismic work in Egypt has never been too satisfactory.

As much of the oil-operations work as possible is done by Egyptians with Egyptian Standard continuing to follow the policy of sending numerous nationals to the United States for highly technical training, the training periods running from a few months to a year or more.

Geology of Western Egypt

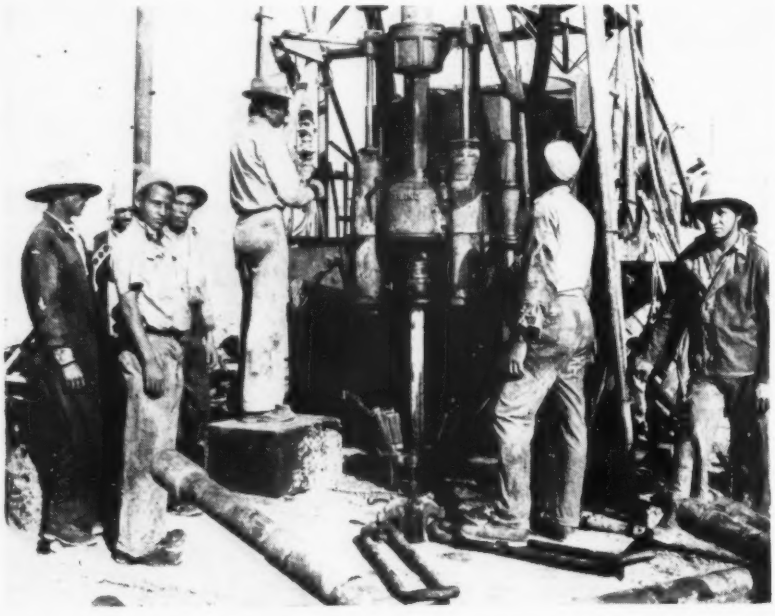
Commenting on the geology of western Egypt, a Jersey Standard official pointed out that the Red Sea is a continuation of the famous Rift Valley of Africa. At Sinai it splits with one segment becoming the Gulf of Suez and the other the Gulf of Aqaba. In turn, extension of the Gulf of Aqaba is where the Red Sea is located.

The Rift Valley is covered by a segment of earth which is sinking, geologists state, while the sides remain rigid. It is known that in the Gulf of Suez the amount of displacement is about 10,000 ft. in certain parts, and it is thought that something on the same order exists in the Gulf of Aqaba.

In Egypt's Western Desert Province, very little drilling has been done and all tests have been dry holes. The area has a large exposure of Oligocene, Miocene, and Pliocene strata. Huge areas are hidden below alluvial and wind-blown desert so that geophysical methods are being employed to obtain information as to the tectonic possibilities.

(Extensive information about Egypt's geological history and current oil operations was written by C. O. Willson, editor of the Journal, who visited the Middle East in 1945. The articles were published December 1 and December 8, 1945.)

A. L. Owens is general manager of Egyptian Standard's operations in Egypt, with O. A. Seagar as assistant manager, and W. K. Esgen, exploration manager.



Egyptians man the drilling rigs in the wildcat operations of Standard Oil Co. of Egypt near the famous pyramids of Giza. Pictured here are some of the workmen of the core-drilling crew who receive instruction in this operation from an expert American driller. Their job is to obtain core samples of subsurface strata in the Abu Roash well

Cooperatives Organize International Association

ZURICH, Switzerland. — Formation of the International Cooperative Petroleum Association, with an authorized capital of $15,000,000 (of which $900,000 has been pledged) has been approved by the International Cooperative Trading Agency.

It was announced that the new organization "will serve as a worldwide yardstick for petroleum prices and may create a pattern for a middle-of-the-road economic policy for nations of the world."

Twenty-two organizations reportedly have indicated willingness to participate. Among them are cooperatives in the United States, Sweden, Scotland, France, Belgium, China, Cuba, the Netherlands, Norway, South Africa, Australia, Iceland, Argentina, Egypt, Finland, Greece, Italy, Palestine, Philippines, Puerto Rico, Siam, and Tunisia.

Activities of I.C.P.A. are to get under way as soon as 10 central organizations sign the articles and subscribe capital of $500,000.

Before leaving New York early in September, Howard A. Cowden, president of Consumers Cooperative Association, told newsmen there that he favored the organization of an international oil body which would function under the guidance of the United Nations. Such a body, he said, was particularly desirable "to control" Middle East crude. He added C.C.A., and the then projected I.C.P.A., would press for the organization of a U.N. oil body.

Since the close of World War 2, U.S. cooperatives have shipped oil to cooperatives in Australia, Belgium, China, France, Holland, Norway, South Africa, and Sweden.

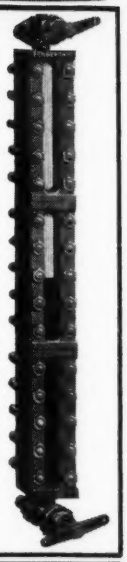
Trinidad Production Listed

NEW YORK. — Crude-oil production of Trinidad Leaseholds, Ltd., in August showed a slight drop from the previous month on a daily-average basis. August production was 495,116 bbl., or 15,971 bbl. daily, against 509,897 bbl., or 16,448 bbl. daily in July, and 499,445 bbl., or 16,648 bbl. daily in June.

PENBERTHY

"REFLEX"

DROP FORGED STEEL LIQUID LEVEL GAGES



Liquid always shows black—empty space shows white. Preferred where the liquid level must be easily and positively visible, and when liquids are under high pressure or at high temperature. Made of alloy temperature resisting steel and are highest quality throughout. Liquid chamber made from solid block of steel to assure perfect alignment and rigidity. Conform with A.P.I.—A.S.M.E. requirements.

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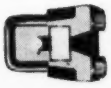

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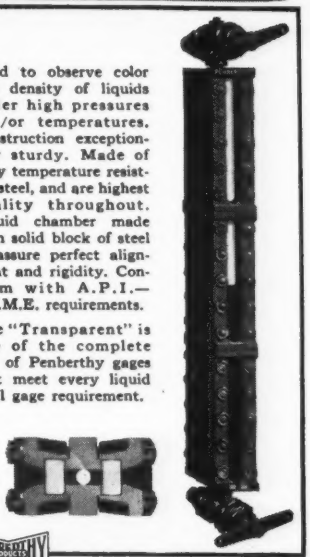

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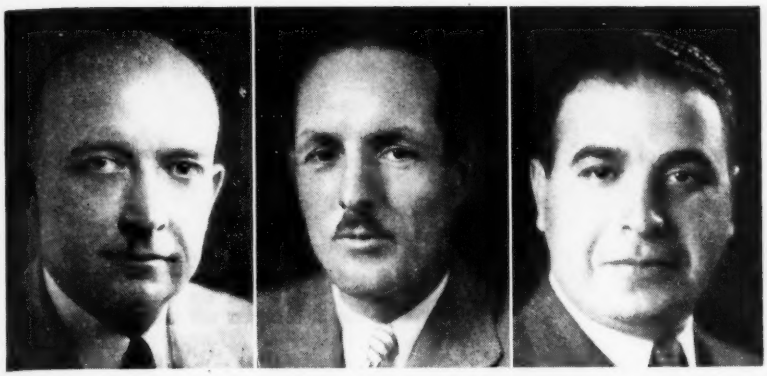

Among speakers and presiding officers at the annual fall meeting of the California Natural Gasoline Association were: E. G. Ragatz, manager of the natural-gasoline division, Bechtel Brothers McCone Co.; R. C. Alden, Bartlesville, Okla., director of research, Phillips Petroleum Co.; and M. W. Kibre, assistant manager of General Petroleum Corp.'s gas department and C. N. G. A. president

C.N.G.A. Speakers See 50 Per Cent Gain in West Coast L.P.G. Demand

by H. Stanley Norman

LOS ANGELES.—Predictions that natural-gasoline manufacturers will soon achieve a more direct relationship with motor-fuel production were made here October 11 at the annual fall meeting of the California Natural Gasoline Association. Forecasts also were made that the natural-gasoline industry will be required to supply almost spectacular growth in West Coast consumption of liquefied petroleum gases.

Technical papers were given that described plant facilities and engineering factors which culminate in ability of plant operators to meet the needs of changing conditions.

Approximately 600 natural-gasoline industrialists, mostly from California but joined by an inordinately large delegation from the Middle West and eastern producing states, attended the 1-day meeting at the Ambassador Hotel. The meeting concluded with a banquet to which 750 tickets were issued. C.N.G.A. officers are elected at the annual spring directors' meeting.

M. W. Kibre, assistant manager of the gas department, General Petroleum Corp., and president of C.N.G.A., presided at the banquet. E. G. Ragatz, manager of the natural-gasoline division, Bechtel Brothers McCone Co., chairman of the fall-meeting committee, presided at the morning session and was coauthor of one of the technical papers presented in the afternoon. F. J. Colton, superintendent of the gas department at Long Beach for Tide Water Associated Oil Co. and vice president of C.N.G.A., presided at the afternoon meeting. Entertainment during and following the banquet was arranged by a committee headed by P. W. Mettling, Los Angeles manager for Cooper-Bessemer Co.

R. C. Alden, Bartlesville, director of research, Phillips Petroleum Co., pointed out the possibilities of integrating methane conversion with natural gasoline and distillate operations and conversion of ethane, propane, and butane to result in a refinery operation based on natural gas. He cited the potentialities for manufacturing oxygen as worthy of immediate study in natural-gasoline operations.

In his paper entitled "Conversion of Natural Gas to Liquid Fuels," Alden predicted a reduction in costs to about 5 cents per gallon. Reduced costs will be realized, Alden predicted, because of:

1. Use of relatively pure, cheap oxygen directly with natural gas.
2. Or alternatively, large bed reactors for the methane-steam-carbon dioxide route.
3. Improvement in catalyst.
4. Use of fluidized or suspensoid catalytic type of operation.

The process, he said, yields somewhat more than 4 gal. per 1,000 cu. ft. of methane and higher yields for higher hydrocarbons proportionate to their carbon content.

Alden anticipates that the conversion of natural gas to liquid fuels can compete with fuel markets for natural gas and with crude oil as a source for motor fuel. He emphasized the yield of high-quality diesel fuel resulting from the gas-conversion process for the special consideration of California operators.

An increase of 50 per cent in the Pacific Coast demand for L.P.G. by end of 1950 was anticipated by C. D. Gard, Union Oil Co. of California, and Hugh F. Colvin, consulting engineer, in their discussion of the "Economic Outlook for California L.P.G." The Pacific northwestern territory offers particularly high potentialities for expansion of L.P.G. consumption. California, the authors said, has lagged somewhat behind the rate of increasing L.P.G. consumption reported on a national basis. The trend to rural development in northern California, Washington, and Oregon with accompanying expansion of demand for L.P.G. as a domestic heating fuel figures prominently in the conclusion that Pacific Coast consumption will rise 50 per cent over the next 4 years.

Costs of Other Fuels Cited

Rising cost of other fuels is a factor in predictions that L.P.G. will enjoy increasing demand. Gard and Colvin presented the accompanying table showing comparative values with an arbitrary assumption of propane at 3.5 cents per gallon and butane at 4 cents.

Operation of a fat-oil deethanizer for increasing propane production by 50 to 100 per cent, under proper conditions, was described by A. M. Whistler, process consultant, C. F. Braun & Co., Los Angeles. The deethanizer described by Whistler was installed about 1 year ago, and it is fed fat oil from a 550-psig. main absorber. Feed enters the middle section of the column and the top is refluxed with lean oil. Reboiling of bottoms from the tower is done mostly by exchange with hot lean oil. More than 70 per cent of the propane is recovered from the fat oil with a purity of 99 per cent. Recovery of propane, Whistler explained, can be increased by lowering purity. No reabsorber is needed because recovered hydrocarbons totally condense at 100 psig. in the stripper accumulator.

Two operating conditions must exist

(Continued on page 103)

COMPARATIVE VALUES OF FUELS

Product—	Quantity	Propane at 3.5 cents per gal.	Butane at 4 cents per gal.
Fuel oil (9°-12° gravity)	1 bbl.	$2.43	$2.62
Natural gas (1,150 B.t.u.)	1,000 cu. ft.	.44	.47
Coal	1 ton	10.54	11.34
Stove oil	1 gal.	.0528	.0568
Electricity	1 kw.-hr.	.13	.14

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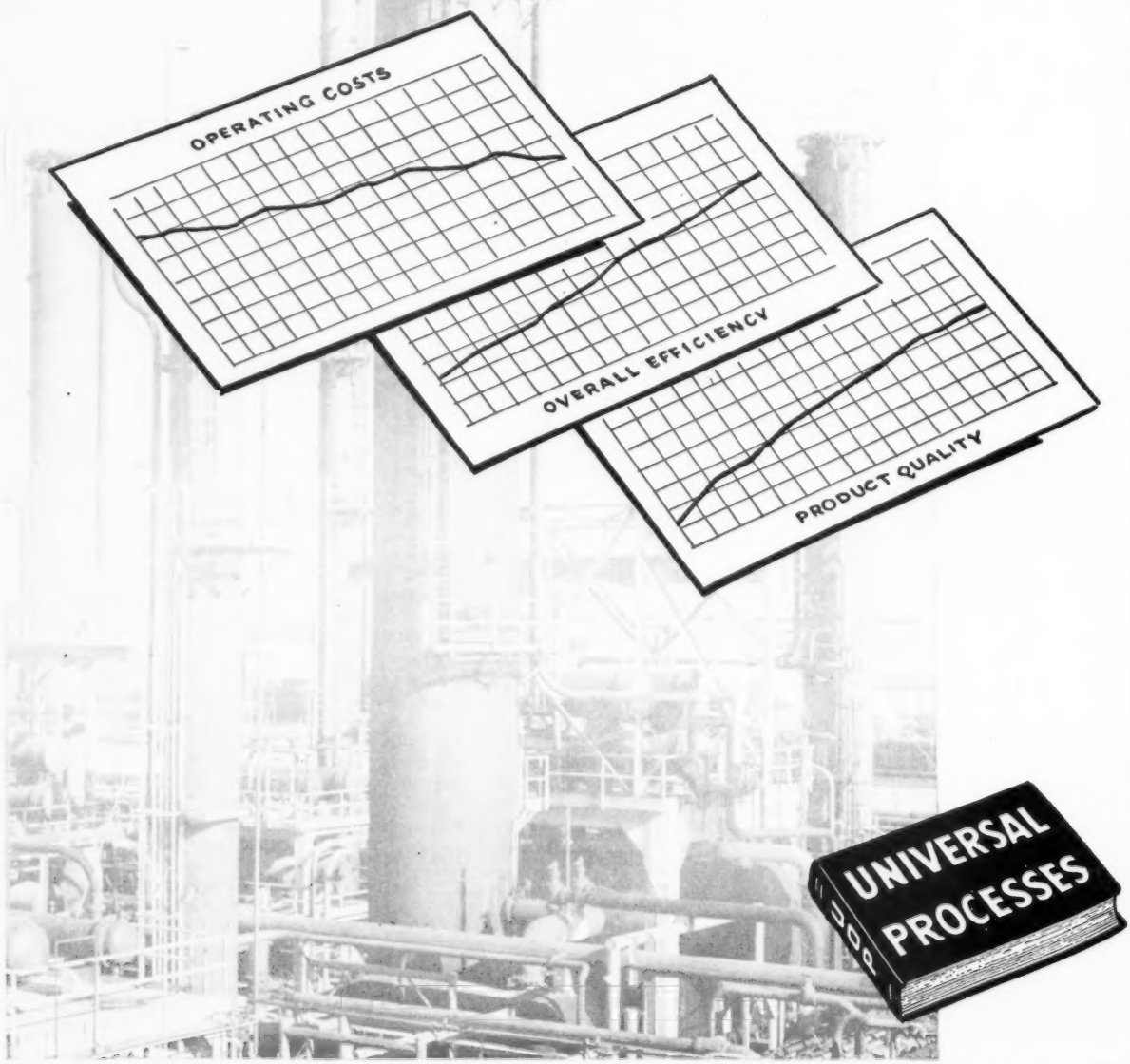

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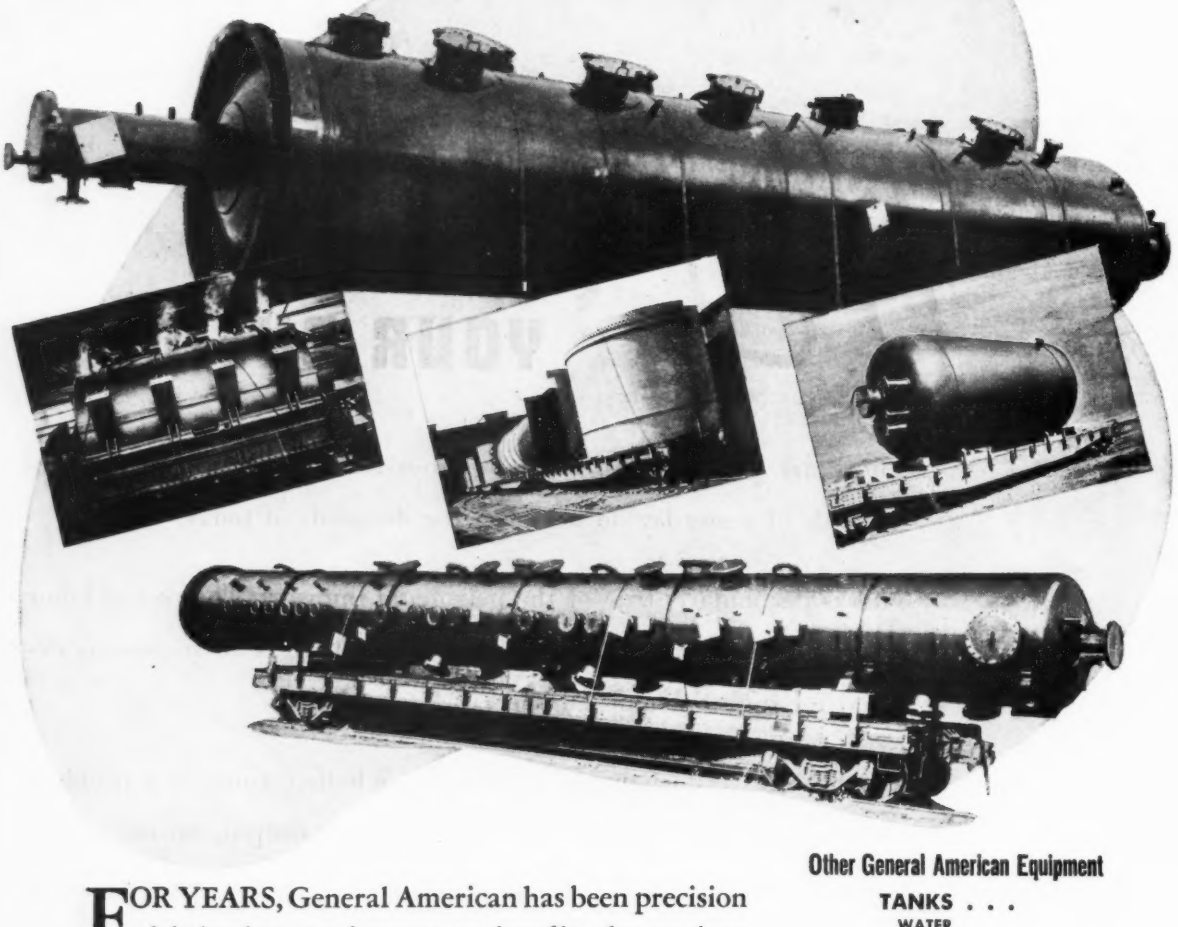

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(Continued from page 99)

simultaneously to justify installation of a fat-oil deethanizer: (1) Propane recovery must not be the primary aim of the plant, meaning that oil rates are set by butane production; (2) a fairly good market must exist for propane, making the payout attractive. Under these conditions, Whistler said, the profit from propane can far exceed the extra fuel cost. First costs of deethanization tend to be lower on other types of plant.

Development of an analytical technique for evaluating absorber performance which seems to eliminate some of the indecisiveness of conventional methods was described by Ragatz and James A. Richardson, process engineer, natural-gasoline division, Bechtel Brothers McCone Co. The Ragatz and Richardson method is said to excel for these reasons: (1) It utilizes simple data obtainable from presently installed commercial columns; (2) provides automatic check on consistency of key-component recoveries, and (3) predicts relative key-component recoveries with an accuracy within prescribed limits needed for precise engineering design.

Method Developed From 75 Tests

The method was developed from analyses of 75 tests on 35 different commercial columns operating at pressures ranging from 40 to 1,800 psig. It permits the writing of accurate specifications for performance without subsequent operation of the column at a fixed per cent of key-component recovery. The method also permits testing a given column for accurate comparison of its operating efficiency with that obtainable from most efficient of commercial columns.

Conventional tray-absorber analysis lacks decisiveness, the authors asserted, in that its basic "tray efficiency" factor shifts in value for different key components in a given column operation or for the same key component as operating conditions are varied to change the degree of recovery. This shifting of the basic evaluation factor with both the key component and its degree of recovery has limited usefulness of the conventional analysis for accurate specification definition or for precise operating column comparison, the authors asserted.

Drs. B. H. Sage, W. N. Lacey, and Robert H. Olds, California Institute of Technology, presented data on the partial enthalpies of hydrocarbons when present in multicomponent systems. The authors and their associates have previously determined values for the enthalpies of single-component light hydrocarbon systems. The current work with more complex multicomponent systems deals with data required by engineers in designing and operating modern plants for maximum efficiency and diversity.

More Than 2,000 Oil Men Expected at A.P.I. Meeting

MORE than 2,000 oil men from all parts of the United States will converge on Chicago November 11-14 for the twenty-sixth annual meeting of the American Petroleum Institute, the second since the war's end but the first in a full peacetime year.

The preliminary program released by the Institute in New York showed that subjects of public relations, agriculture and the industry's general prospects for the future will spotlight the general sessions. In addition, numerous technical papers are scheduled for the various group sessions.

Registration will open Monday morning, November 11, in the Stevens Hotel, convention headquarters. In releasing the preliminary program, the Institute said names and topics of some other speakers will be announced later.

The industry's public-relations responsibilities and opportunities will be highlighted at a general session Tuesday evening, November 12, and a forum, Wednesday morning, November 13. The general session will hear Claude Robinson, president of Opinion Research; John J. Pelly of the American Association of Railroads, and Robert T. Haslam, vice president of Standard Oil Co. (N. J.), chairman of the institute's public-relations committee. Five public-relations men from the oil industry and five petroleum editors will discuss questions at the forum following the prepared addresses.

Secretary of the Interior J. A. Krug will speak at the second general session Wednesday afternoon, November 13. For the general session Wednesday evening, a special-events committee is preparing a program to be announced. At the final general session Thursday morning, November 14, Eugene Holman, president, Standard Oil Co. (N. J.); Ralph T. Zook, Sloan & Zook Co., and J. Howard Pew, president, Sun Oil Co., will speak. The session is entitled "Looking Ahead."

Other features at the meeting include the seventh annual dinner of the 25-Year Club Tuesday evening, November 12, and a dinner of the Pipe Liners Club Monday evening, November 11.

Preliminary Program

The preliminary program, exclusive of committee meetings, follows:

MONDAY, NOVEMBER 11

Symposium of high-temperature analytical distillation, 2 p.m.—Sponsored by committee on analytical research, Harry Levin, The Texas Co., Beacon, N. Y., presiding. "Analytical Distillation-General Principles and Definitions," C. R. Reed, The Texas Co., Beacon, N. Y; "High Temperature Fractional Distillation-½-In. Ewell Column," C. R. Reed; "Evaluation of Laboratory Batch Fractionating Columns," A. W. Goldsbarry and R. J. Askevold, Pure Oil Co., Winnetka, Ill.; "Concentric-Tube Fractioning Column," C. K. Donnell and R. M. Kennedy, Sun Oil Co., Norwood, Pa.; "The Use of 3-In. Diameter Stedman Columns for Precise Laboratory Fractionation," W. J. Born, B. L. Coffey, and L. G. Garrard, Socony-Vacuum laboratories, Paulsboro, N. J.; "Fractional Analysis of Hydrocarbon Mixtures on a Gallon Scale," R. F. Marschner and W. P. Cropper, Standard Oil Co. (Ind.), Whiting, Ind.; "Precise Laboratory Fractioning Column," H. J. Hall, Standard Oil Development Co., Elizabeth, N. J.; "Operating Characteristics of Hypercal Fractioning Columns," P. L. Brandt, R. B. Perkins, and K. Halverson, Pan American Refining Co., Texas City, Tex.; "Evaluation of Laboratory Distillation Apparatus," F. C. Collins and V. Lantz, Shell Development Co., Emeryville, Calif.; "Laboratory Distilling Columns of High Efficiency Used in the Work of A.P.I. Project 6," C. B. Willingham and F. D. Rossini, National Bureau of Standards, Washington.

Agricultural session, 2:30 p.m.—Sponsored by the agricultural-development committee, George Krieger, Ethyl Corp., New York, presiding. Address by Ladd Haystead, Fortune, New York; address by John Strohm, Association of Agricultural Editors, Chicago; two additional speakers to be announced.

Group session, lubrication, 8 p.m.—Sponsored by the lubrication committee, L. C. Welch, Standard Oil Co. (Ind.), Chicago, presiding. "Organization, Policy, and Program of the A.P.I. Lubrication Committee," L. C. Welch; symposium on "Lubrication for Safety," George L. Neely, Standard Oil Co. of California, San Francisco; J. M. Koch, Quaker Oil Refining Corp., Oil City, Pa., and J. Willard Lord, Atlantic Refining Co., Philadelphia.

TUESDAY, NOVEMBER 12

Taxation session, 10:00 a.m.—Sponsored by the American Petroleum Industries Committee, Edwin S. Hall, chairman, American Petroleum Industries Committee, New York, presiding. Address, L. S. Wescoat, A.P.I. committee on highways, Pure Oil Co., Chicago; address by Robert Ramspeck, Air Transport Association of America, Washington; address by Dr. Harley L. Lutz, professor of public finance, Princeton University, Princeton, N. J.; one additional speaker to be announced.

Meeting of A.P.I. board of directors, 10:30 a.m.

Division of Production, symposium on secondary recovery, 2 p.m.—Paul D. Torrey, Houston, and George H. Fancher, University of Texas, Austin, presiding. Papers on the following subjects planned; speakers to be announced: "Drilling and Coring Methods of Secondary-Recovery Operations," "Utilization of Old Wells," "Use of Explosives," "Source and Purification of Gas Supply," "Distribution Systems and Surface Injection Equipment," "Pumping-Equipment Selection for Secondary-Recov-

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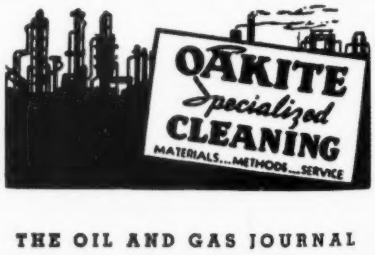

ery Developments," "Separators and Tanks," "Flowing Water-Flood Production," "Effect of Input Pressures and Volumes on Rate of Recovery and on Ultimate Recovery—Water," and "The Use of Plugging Agents."

Division of Refining, group session, gasoline, 2 p.m.—W. M. Holaday, Socony-Vacuum Oil Co., Inc., New York, presiding. "Future Trends in Aviation," Dr. C. C. Furnas, Cornell Aeronautical Experimental Station, Buffalo, N. Y.; election of 45 members of the general committee of the Division of Refining; "Status Report on the C.F.R.-AAF Volatility Flight-Test Studies," H. M. Trimble, Phillips Petroleum Co., Bartlesville; "Analysis of Alkylates and Hydrocodimers," A. R. Glascow, Jr., A. J. Streiff, C. B. Willingham, and F. D. Rossini, A.P.I. Research Project 6, National Bureau of Standards; "Project 6 Spotlights Avgas Progress," D. W. Gould and H. W. Field, Atlantic Refining Co., Philadelphia; "Miscellaneous Fractionating Techniques," J. J. Cicalese and G. S. Houghland, M. W. Kellogg Co., New York, J. A. Davies, The Texas Co., New York; A. J. L. Hutchinson, Fluor Corp.; Alhambra, Calif.; T. J. Walsh, Standard Oil Co. (Ohio), Cleveland; and P. J. Harrington, Standard Oil Development Co., Elizabeth, N. J.; "Naphtha Polyforming," and "Naphtha Polyforming With Outside Gas," P. Ostergaard, Gulf Oil Corp., Pittsburgh; M. C. Fogle, H. Beuther, and W. C. Offut, Gulf Research & Development Co., Pittsburgh; "Correlation of Operating Variables in the Polyform Process," J. H. Hirsch and Offut, Gulf Research & Development Co., Pittsburgh, and Ostergaard.

General session, public relations, 8 p.m.—Address, Claude Robinson, president, Opinion Research, Inc., Princeton, N. J.; address, John J. Pelly, president, American Association of Railroads; address, Robert T. Haslam, vice president, Standard Oil Co. (N. J.), New York.

WEDNESDAY, NOVEMBER 13

Public-relations forum, group session.—Sponsored by the committee on public relations, Franklyn Waltman, Sun Oil Co., Philadelphia, presiding. Address, Fred Eldean, public-relations counsellor, New York; address, Don E. Gilman, Western Oil and Gas Association, Los Angeles; address, Ralph C. Champlin, Ethyl Corp., New York; audience-participation forum.

Division of Production, group session, production technology, 9:30 a.m.—Norris Johnson, General Petroleum Corp. of California, Los Angeles, and K. H. Andresen, South Penn Oil Co., Bradford, Pa., presiding. Papers on the following subjects planned, speakers to be announced: "Advantages of Increased Injection Rates at Water-Input Wells," "Effect of Properties of Flood Water on Rate of Input and Oil Production," "Input-Well Equipment," "Chemical and Mechanical Treatment of Water-Input Wells," and "Homogeneous Permeability Determination."

Division of Marketing, 9:30 a.m.—E. V. Weber, Eureka Oil Co., Cincinnati, presiding. Panel discussion on distillate heating oils, Robert Gray, Fueloil and Oil Heat, New York; W. A. Matheson, Oil-Heat Institute of America, Inc., New York; J. L. Minner, Shell Oil Co., Inc., New York; John R. Sherwood, Sherwood Brothers, Inc., Baltimore; L. B. Fox, Socony-Vacuum Oil Co., Inc., New York; "Balanced Selling at Service Stations," Raymond Shaw, Chek-Chart Corp., Chicago; election of 45 members of the general committee of the Division of Marketing.

Division of Transportation, 9:30 a.m.—B. Brewster Jennings, Socony-Vacuum Oil Co., Inc., New York, presiding. "The Transportation Association of America," Donald D. Conn, Transportation Association of America, Chicago; "Proposals Toward a National Transportation Policy," Fayette B. Dow, Washington, D. C.; "The Transportation of Petroleum Products by 'For-Hire' Carriers," S. F. Niness, Leyman Transportation Co., Downington, Pa.; "Recent Development in Pipe-Line Technology," H. H. Anderson, Shell Pipe Line Corp., Houston; election of 45 members of the general committee of the Division of Transportation.

Meeting of A.P.I. board of directors, 10 a.m.

Meeting of board of councillors, 10 a.m.

Board of directors, luncheon, 12:15 p.m.

General session, 2:30 p.m.—Report of board of councillors and election of directors: president's address, William R. Boyd, A.P.I. president, New York; address, J. A. Krug, secretary of the interior, Washington; address H. E. Babcock, chairman, board of trustees, Cornell University, Ithaca, N. Y.

General session, 8 p.m.—Program being prepared by special-events committee, to be announced later.

THURSDAY, NOVEMBER 14

General session on "Looking Ahead," 9:30 a. m.—Address, Eugene Holman, Standard Oil Co. (N. J.), New York; address Ralph T. Zook, Sloan & Zook Co., Bradford, Pa.; address, J. Howard Pew, Sun Oil Co., Philadelphia.

Division of Production, group session on production problems, 2 p.m.—H. H. Kaveler, Phillips Petroleum Co., Bartlesville, and Lot Bowen, Western Gulf Oil Co., Los Angeles, presiding. Papers on the following subjects planned; speakers to be announced: "Reservoir Performance and Well Spacing—Silica Arbuckle Pool," "Gas-Condensate Fields—a Review," "Corrosion and Preventive Methods in the Kath Field," "Practical Aspects of Directional Drilling," "Factors Influencing the Leakage Resistance of Threaded Pipe Joints." Election of 45 members of the general committee of the Division of Production also is scheduled at this session.

Large Consumption Increase Forecast

THE optimistic outlook for petroleum consumption in the next few years took on more support last week when John W. Boatwright, manager of the sales-research department, Standard Oil Co. (Ind.), spoke before the Petroleum Club of the Cleveland, Ohio, Chamber of Commerce.

In forecasting a gain in daily consumption of gasoline to about 2,350,000 bbl. sometime in the next 5 years—30 per cent over 1941—Boatwright said he was definitely bullish about the future of the industry. This position, he continued, is one that is supported by the expansion in the automotive industry, the growth of air traffic, the increasing mechanization of agriculture, the development of diesel utilization, the development of an ever expanding market for industrial petroleum utilization, and the increasing desire for oil heat.

The Indiana Standard official made it plain his predictions considered the "5-year possibilities without naming the specific year such objections may be reached." The underlying assumption, he said, "is that we shall continue to operate in a free enterprise system comparable, soon I hope, with prewar conditions." Among his statements were the following:

"The consumption of motor gasoline should increase substantially. Our analysis indicates that there will be from 33,000,000 to 34,000,000 passenger cars in use 5 years following the termination of the war. The long term trend of gasoline consumption per car should continue upward, although current high rate will tend to adjust downward to the trend levels during the forthcoming few years. Trucks should increase by approximately 18 per cent. Gasoline consumption by trucks will not increase correspondingly as there will be an accelerated transition from gasoline consuming units to diesel-powered equipment, and to trucks and buses utilizing liquefied petroleum gases. This latter type market has already reached substantial development in some sections of the country.

"It is my personal expectation that a 5-year span will be adequate to bring about a nucleus of farm diesel tractors utilizing a light diesel fuel of the kerosene cut or slightly heavier, depending upon the type of fuel for which the vehicle is designed. The more distant future may see an expansion of kerosene consumption from this field. I believe, however, that the major factor which is going to cause the expansion of kerosene demand will be incident to range-oil utilization. I anticipate that the total demand for kerosene within a 5-year period will approximate 260,000 bbl. per day as compared with 190,000 bbl. per day in 1941, or an increase of nearly 37 per cent . . . Watch the estimated number of oil burners in use go up from 2,700,000 to 4,000,000 or over within the next 5 years. Consumption of oil for home heating should increase at least 40 per cent during the next 5 years . . .

"I believe the utilization of residual fuel for radiation purposes will increase during the next few years. Utilization by railroads has shown a strong upward trend and should hold firm with some growth. Consumption by vessels and tankers will undoubtedly remain high in the near future as we face a strong commodity export market, at least during the rehabilitation years of war-ravaged countries . . . Utilization by individual types has been examined and trends calculated. The correlation with the Federal Reserve Bank index, excluding the war years, has also been extended into the postwar period. From the analysis, I would anticipate that the demand for residual fuel within a 5-year span would approximate 1,400,000 bbl. per day as compared with a consumption level of 1,050,000 bbl. per day in 1941, representing an increase of 33 per cent."

WASHINGTON WATCHING

BY HENRY D. RALPH

Teapot Dome Leasing

WASHINGTON. — The Office of Naval Petroleum Reserves is puzzled over the sudden rush of inquiries from the Rocky Mountain area regarding a purported recent announcement by its director, Com. William G. Greenman, to the effect that the Navy is willing to relinquish control over its Teapot Dome reserve in Wyoming.

The fact is that the commodore has been in Alaska for several weeks, but nearly a year ago he stated the official Navy position that there is no objection to abandoning Teapot Dome and opening it up to private leasing by the Interior Department under the general leasing act. This is still the Navy's position, but nothing has been done about putting it into effect. As explained at that time, congressional legislation would be required to permit production from Teapot Dome.

Testifying before the Senate petroleum-resources committee on November 30, 1945, Commodore Greenman presented a statement he said had been prepared with great care to express the Navy's policy and had been personally approved by the Secretary of the Navy. The previous witness had been the then secretary of the interior, Harold L. Ickes, who ridiculed the whole idea of Naval petroleum reserves, comparing them with oat reserves for the cavalry, and suggesting that they all be turned over to Interior for development.

Naval Reserves Defended

Greenman's statement contained a spirited defense of Naval reserves and declared the Navy would put up a vigorous fight to retain control of Reserves No. 1 in Elk Hills, California, and No. 4 in northern Alaska, but has no further interest in No. 2 at Buena Vista Hills, California, nor No. 3 at Teapot Dome, Wyoming.

"I have previously stated to this committee," Greenman said, "that the Teapot Dome reserve has no value from a military point of view as far as future oil in quantity is concerned. If Congress sees fit to elect that it be returned to the Department of the Interior I do not believe that the Navy would raise any objection. The same thing applies to Buena Vista Hills, Reserve No. 2,"

Teapot Dome reserve consists of 9,321 acres and was set aside in 1915. At that time it was estimated to contain a minimum of 125,000,000 bbl., but the present estimate is 8,000,000 to 10,000,000 bbl., though the shallow sand has not been drilled in depth. The field has been shut in since 1928, and since the Government owns the entire field there has been no drainage. Maximum production is estimated at 2,000 bbl. per day and during the war the Navy and the Petroleum Administration for War explored the possibility of opening it up but the idea was abandoned because of the small amount of crude which could be obtained in view of the amount of effort and materials required and the remoteness of the field from areas of greatest demand.

The Buena Vista Hills reserve consists of 30,181 acres but only one-third belongs to the Navy, so to meet the offset problem a cooperative development plan was adopted in 1935, and the field has been produced steadily since then. Congressional legislation could transfer administration of the leases from Navy to Interior but would not materially affect the operation of the field.

A Boost for Small Business

THE Advertising Club of Washington had the unusual privilege last week of hearing the attorney general of the United States get a lecture on the benefits of competition and the rights of small business from an executive of one of the largest corporations in the world.

R. T. Haslam, vice president of Standard Oil Co. (N.J.), was the guest speaker, and among the many government officials at the head table was Attorney General Tom C. Clark. Haslam had prepared his speech without knowledge that the "A. G." would be present, but he extemporized many offside remarks to the antitrust law enforcer, to the delight of the audience.

Haslam had just returned from a trip to 15 countries in which his company does business, and he was struck with the low standard of living, the high cost of doing business, and the lack of freedom of enterprise he found in both Europe and South America. His conclusion was that America's prosperity and high standard of living cannot be explained by the size of our population or area or our natural resources but are due primarily to our economic freedom, the absence of cartels and other restrictive laws, the ability of new enterprises to start business, and competition at all levels to develop new business and bring down costs.

He cited many examples of how businesses in foreign countries could not expand or enter new lines because of cartel agreements or restrictive laws, and showed how these limitations on competition discourage enterprise, protect inefficient operators, and keep prices and business costs at high levels. Many foreign distributors of Jersey Standard's products pay far lower wages than for comparable work in the United States and yet their productivity per man-hour is so low and their general business costs are so high that prices are far above American levels, Haslam said, attributing this entirely to the absence of the American brand of free competition.

More on NPC Organization

THE National Petroleum Council is moving slowly and without apparent exuberance in setting itself up on a permanent basis. Russell B. Brown, general counsel of the Independent Petroleum Association of America, is most anxious to be relieved of his job as acting secretary but seems stuck with it for many months. A temporary budget is being prepared and assessments will be asked to cover expenses for the balance of the year, and crowded Washington is being searched daily for a small office where a girl can be installed to handle mail. Under the procedure adopted at the last council meeting a permanent, paid, secretary-treasurer cannot be appointed until after a permanent chairman is elected.

Nominations Committee Appointed

Acting Chairman Walter S. Hallanan has appointed a committee of NPC members from the five geographical regions of the country to bring in nominations for a permanent chairman, but the committee is instructed to take plenty of time and there is no assurance that it will report at the next quarterly meeting.

One name formally advanced for chairman is that of Ralph K. Davies, acting director of the Oil and Gas Division and former vice president of Standard Oil Co. of California. The nominating committee may consider this, but objections were raised that Davies would not be eligible for two reasons: he is, at the moment, still a government employe rather than an industry man and he is not a member of the council and presumably could

not be made a member unless he becomes connected with an oil or gas company or a trade association in the industry. Council rules provide that the unpaid chairman be a council member, though the paid secretary need not be.

Demonstrating the lack of unanimous enthusiasm for the council, R. H. Colley, president of Atlantic Refining Co., has submitted his resignation. At the last meeting Colley read a statement saying the type of industry forum envisioned is neither possible nor desirable; impossible because legal restrictions prevent cooperative planning and action by the industry, undesirable because in peacetime it is not in the common interest to submerge individual decisions on operation of a business, however necessary this may be in time of war. Colley said the field left for NPC is little more than statistical research which, he said, does not require policy executives and could be done quicker and better by a committee of statisticians.

No other resignations have been received to date, though a good many appointees have not attended either of the two meetings. However, a number of changes in council memberships are scheduled among the exofficio appointees, due to the election of new presidents by several of the trade associations represented on NPC.

Of the three functional committees created at the last meeting, those on leasing regulations and materials shortages have not yet met. The committee on pressure-tank cars has been hard at work, but there is a question as to its effectiveness if, as contemplated in the NPC plan of organization, its recommendations must await action until presented to the next quarterly meeting of the full council.

Help Wanted: A Director

RALPH K. DAVIES is not getting much help from the oil industry nor elsewhere in his effort to find a successor to himself as director of the Oil and Gas Division.

Secretary of the Interior Krug has left it to him to locate a satisfactory candidate for the appointment, and Davies has several times asked the oil industry for help. Davies says he is pursuing a few clues but hasn't yet been able to put his finger on the right man.

The man Davies wants for this position is a man who (as the political orators put it) has the highest integrity and ability, a man who is well and favorably known to the oil and gas industries and who, on his part, understands the problems and complexities of these industries; a man who can sympathize with and speak for all branches and factions of the industry and is not too closely allied with any of them; a man who can handle the routine administrative problems of a government bureau and at the same time make a good impression before congressional committees and public gatherings; and, above all, a man who will do all this for a civil-service salary of $10,000 per annum.

Such a man might be an oil-company executive or college president, but the rub is that most such probably have more income and prestige and fewer headaches in their present positions. The suggestion was broached that industry might "lend" a man to the Government and supplement his government stipend with an outside honorarium, but it was quickly agreed that such cannot be done except in wartime and would quickly bring the charge that the industry controlled a government official who was supposed to control it.

Everyone agrees that it is greatly to the interest of the oil and gas industries that an able man be appointed director of OGD, but so far no one has given Davies much help in his quest.

Whitewashing the Coops

A NEW attack on the special tax position of cooperative associations is promised in the next Congress by Rep. Walter C. Ploesser of Missouri in a scathing letter to Rep. Wright Patman of Texas, chairman of the House small-business committee.

Last summer this committee issued a report on its investigation of coops in which it concluded that a cooperative "apparently has no unfair tax advantage over any other type of firm or corporation which may elect to operate on the same basis." Ploesser, who is a member of the small-business committee, wrote that he had been told the report would be only factual, but he now considers it "completely misleading and deceptive," has done great harm to the interests of private business, and "constitutes a complete whitewash of cooperatives from the standpoint of tax exemption."

Reexamination Threatened

Ploesser charged Patman with stirring up coops to defend the report and warning them that private business would attempt to offset it, and the Missourian announced that when Congress reconvenes he will move quickly for a complete reexamination of the committee's action.

The committee's conclusion that coops have no tax-profit motive and its suggestion that private business adopt cooperative methods is unfair and revolutionary, Ploesser declared, challenging Patman to produce facts to support statements that tax advantages of coops are relatively small and in no way give coops an undue advantage over private business. While not mentioning oil coops specifically, Ploesser said he personally knows of two coops which have enjoyed an amazing growth due almost entirely to the fact that they have been able, year after year, to reinvest their actual net earnings without taxation.

Safety Winners Named By National Council

CHICAGO. — Thirteen oil-industry companies completed the 1945-1946 fiscal year without a serious accident, the National Safety Council's petroleum section announced last week, while 23 companies won 32 separate awards for reducing their accident rate. The accident index rate of the 164 companies participating in the safety contest increased 1 per cent to 19.78 from the preceding period's rate. The natural-gasoline department made the greatest reduction in accident rates—50 per cent—it was announced.

The companies winning reduction awards included: Standard Oil Co. (Ind.); Shell Oil Co., Inc.; Lago Oil & Transport Co., Ltd.; Arkansas Fuel Oil Co.; Mid-Continent Petroleum Corp.; Kendall Refining Co.; Ohio Oil Co.; Atlantic Refining Co.; Pan American Petroleum & Transport Co., Inc.; Union Oil Co. of California; Magnolia Petroleum Co.; Continental Oil Co.; United Gas Pipe Line Co.; Humble Oil & Refining Co.; Cities Service Oil Co.; Magnolia Pipe Line Co.; Arkansas Louisiana Gas Co.; Gulf Refining Co.; Lone Star Gas Co.; Ajax Pipe Line Corp.; Mid-Continent Pipe Line Co., and Gulf Oil Corp.

Government Granted Delay In Answering Sun Motion

WASHINGTON.—The U. S. District Court here October 14 granted a motion by the Department of Justice postponing from October 15 to December 15 the time in which the Government must either answer or file objections to answering the interrogatory of Sun Oil Co. in the antitrust suit against the American Petroleum Institute and all major oil companies.

Sun was the only defendant to file in proper form last July a demand that the Government provide a bill of particulars specifying exactly how Sun is alleged to have violated the law. The Government motion for another 60 days to decide whether or not it wants to answer such questions indicates that the Department of Justice is far from ready to try the 6-year old case and that further indefinite delay is in prospect.

HOW EFFICIENT IS THE HORTONSPHERE and HORTONSPHEROID?

A checkup on an installation consisting of one 80,000-bbl. and three 40,000-bbl. Hortonspheroids designed for working pressures of 2½ and 3 lbs. per sq. in. respectively, and three cone roof storage tanks ranging in capacity from 10,000 to 55,000 bbls. illustrates the efficiency of the Hortonspheroid in stopping evaporation losses. The Hortonspheroids were equipped with pressure recorders and charts which show that they vented only when being filled and that no venting occurred during periods of standing storage.

The effectiveness of Hortonspheres is shown in a recent checkup covering the operation of a 54-ft. 9-in. diam. sphere designed for a working pressure of 75 lbs. per sq. in. The most volatile product handled in this sphere is a mixture of 60-lb. butylene and 76-lb. gasoline. The investigation revealed that there is *no evaporation loss whatsoever* from this Hortonsphere.

Here are Some of the Advantages of Pressure Storage as provided by Hortonspheres and Hortonspheroids:

- **Positive Protection**
- **Maximum Economy**
- **Low Maintenance Cost**
- **Dependable Operation**
- **Low Fire Hazard**
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NIGHT AND DAY

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The two 32-ft. diam. and the three 28-ft. diam. Hortonspheres shown in the night view on the opposite page and the two 20,000-bbl. Hortonspheroids shown below were used by the Ashland Oil & Refining Company during the war for storing volatile products at its aviation gasoline plant near Catlettsburg, Ky. The Hortonspheroids stored charging stock for the retreating unit and the Hortonspheres handled the more volatile hydrocarbons.

When you need storage facilities for volatile products investigate the Hortonsphere and Hortonspheroid. These pressure vessels give you maximum protection against fire hazard and evaporation losses and years of trouble-free service at no operating costs aside from general maintenance.

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HORTONSPHERES

. . . . are used to store the more volatile grades of natural gasoline, butane, butane-propane mixture and volatile refinery charging stocks.

. . . . prevent breathing and boiling losses and reduce filling losses from a wide range of products.

. . . . are available in standard capacities for pressures as high as 100 lbs. per sq. in. up to 40 ft. in diam., 150 lbs. up to 30 ft. in diam. and 200 lbs. up to 22¼ ft. in diam.

HORTONSPHEROIDS

. . . . are used to store hydrocarbons ranging in volatility from motor gasoline to natural gasoline.

. . . . reduce evaporation losses caused by boiling and breathing.

. . . . plain type built in capacities of 2,500 to 40,000 bbls. for pressures from 2½ to 35 lbs. per sq. in.

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Atlanta, 3	2154 Healey Building	San Francisco, 11	1254-22 Battery Street Building
Birmingham, 1	1536 North 50th Street	Detroit, 26	1514 Lafayette Building

West Coast Refinery Prices Drop Due to Shipping Tieup

A BACKUP in refined products resulting from the maritime strike last week forced refinery prices for motor fuel, diesel fuel, and stove oil down about ½ cent in California.

Results of the shipping tieup also were felt on the East Coast. In the New York area, residual demand was reported slackening due to the lack of bunkering requirements.

On the West Coast, the inability to move packaged petroleum products for several weeks weakened the domestic market to the point where small California refineries were making limited offerings of housebrand gasoline at 6¼ cents, a full ½ cent under the stable market previously prevailing.

In Los Angeles, market observers expected the market to right itself as soon as normal ship movements resume. For the present, however, available dock space was filled with drums awaiting lifting for foreign destinations.

The industry's heavy products-stock position, particularly of those needed for winter consumption, appeared to be weakening the market in New York for No. 2 and kerosene in some cases. Suppliers were awaiting the drain of an expected record winter consumption.

In the Mid-Continent area, tank-car gasoline continued to show signs of slipping. Spot-market motor fuel was reported moving at prices ranging up from 6½ cents for regular. Burning oils as a whole were described as still sluggish, although No. 1 and range oil were in better demand. Pipe-line gasoline, carrying the advantages of lower transportation costs, was still in demand among suppliers.

The natural-gasoline market was extremely strong, due not only to normal seasonal demand but also to the desire of refiners to increase lead susceptibility. Group 3 26-70 natural gasoline was quoted at 4¾ cents.

The increasingly critical lead shortage was a subject of discussion among refiners and marketers. One informed marketer said a considerable volume of motor fuel now on the market carries less than the standard 73-75 octane for regular and 78-78½ for premium.

Phoenix Refinery, West Texas Pipe Line Planned

PLANS are being made, according to reports, for building a 600-mile, 8-in. pipe line to cost $7,500,000 from West Texas to Phoenix, Ariz., to serve projected $2,500,000 Phoenix refinery.

The same interests are reported concerned with both projects; operations will be conducted under the name of Arizona Pipe Line Co. and Phoenix Refining Co.

The enterprise is reported headed by R. H. Hawn and John Mills, Phoenix businessmen with oil interests in Texas and hotel operations in the Southwest. Associated with them are: W. R. Wayland, C. L. Strous, and H. R. Askins, president, Phoenix Auto Supply Co. Investors are listed as: J. Sargent McGuire; F. E. Richardson, pipe-line engineer; Hal Le Brecht, president, Merchants Bank, Kansas City, president, Bank of Trinidad, Trinidad, Colo., and director, Federal Reserve Bank, Tenth District.

With four pump stations the proposed line is scheduled for a capacity of 10,000 bbl. with additional pump stations, throughput could be increased to 25,000 bbl. The refinery is expected to produce 5,000 bbl. daily of gasoline and 1,500 bbl. of asphalt.

The group is reported to have an option to buy 200 miles of 8-in. pipe now in Italy and is said to be in a position to procure the remainder of the pipe as needed. The refinery is to be purchased from the federal Government; its present location is not disclosed. It is to be dismantled for erection at Phoenix. Retail facilities are not contemplated in the project. The refinery is planned to meet 30 per cent of demand in Arizona. Construction work is to start in January and to be completed in 9 to 12 months.

DEATHS

George T. Blankenship, 54, partner in the Trapp & Blankenship Oil Co., died October 7 at his home in Oklahoma City.

F. M. Foster, 88, independent oil operator, died October 8 at his home in Tulsa. He had been active in the oil business in Oklahoma since 1901 and helped develop Healdton field near Ardmore, Okla.

Keefer L. Laufman, 53, auditor for the pipe-line division of Sinclair Refining Co., died October 9 in Independence, Kans. He had been with the company 24 years and was also auditor for the crude-oil marketing division of Sinclair Prairie Oil Co.

C. Henry Hathaway, 61, assistant to the vice president of Gulf Oil Corp., died October 7 in Bronxville, N. Y. He had been associated with Gulf since 1932 and was an assemblyman in the New York Legislature from 1929 to 1933.

Archie Baldwin, 78, general manager of Snowden & McSweeney Co. from 1913 until his retirement in 1940, died October 7 in Chicago. He previously had been general superintendent of Jennings Producing Co. of Pittsburgh and later general superintendent of Pure Oil Co.

John M. O'Day, 76, retired general manager of Sinclair Refining Co., died October 10 in New York.

Participants in A.I.M.E. Galveston Program

Among the members of the Gulf Coast Section of the American Institute of Mining and Metallurgical Engineers who participated in the arrangements and hospitality for the Galveston, Tex., meeting (The Oil and Gas Journal, October 12, page 55, and October 5, page 88) were: A. B. Stevens, Texas A. & M. College; Haylett O'Neill, Humble Oil & Refining Co.; W. D. Morris, Oil Field Machine & Supply Co.; Bill W. Strang, executive secretary, petroleum division, A.I.M.E.; Frank Briggs, Houston Oil Field Material Co.; Mercer R. Parks, Humble Oil & Refining Co.; and Charles Reed, Dow Chemical Co., Houston

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TRIMET

by Ralph W. Disney*

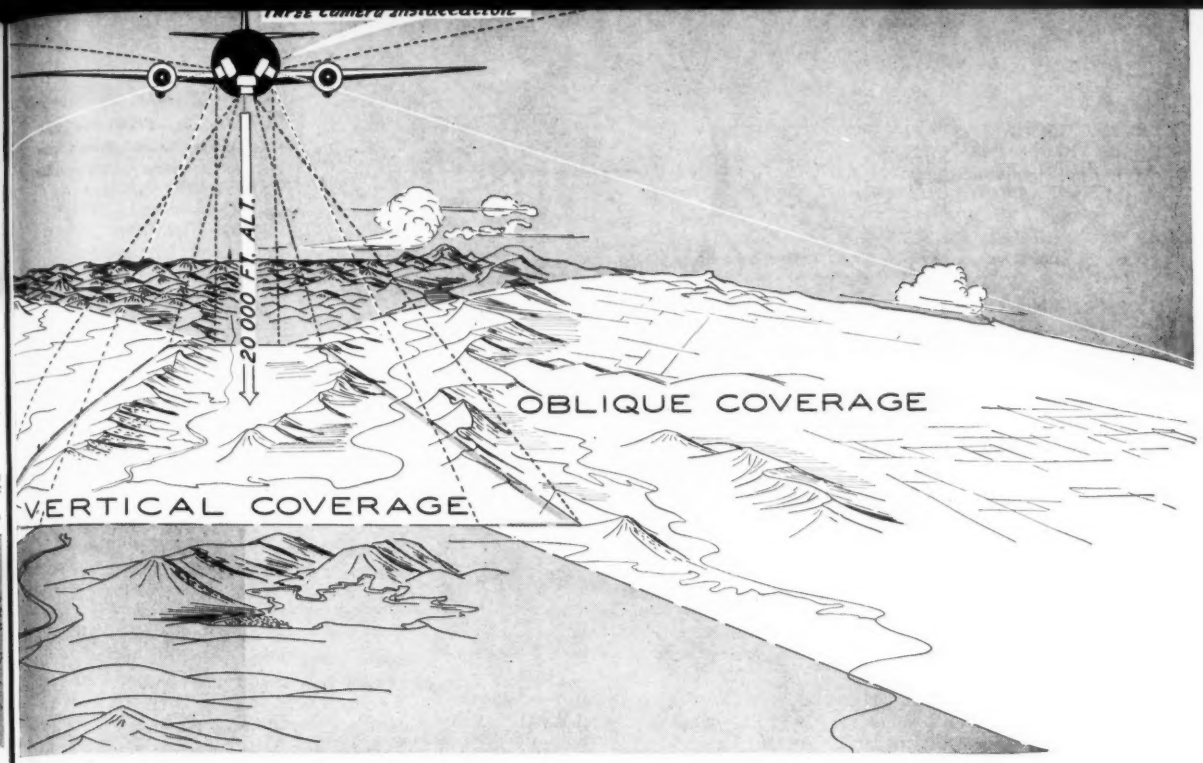
Fig. 1 — (Top of page) This diagram illustrates how trimetrogon works. A combination unit of three cameras takes one vertical and two oblique photographs which when put together give a horizon-to-horizon bird's-eye view of the terrain

The three photographs at the left are typical of those taken by trimetrogon aerial photography. This photograph was taken near the Colorado-New Mexico border

TRIMETROGON aerial photography, about which very little has been made public, is a wartime development of the science of photogrammetry. To the petroleum industry it offers great potentialities for use as a low-cost geological reconnaissance method, as well as numerous miscellaneous applications. In combination with radar, it may well develop into the cheapest and quickest known method of making extremely accurate base maps of totally unknown territory with a minimum of actual ground-party work.

Fig. 1 illustrates how trimetrogon works. A combination unit of three cameras is mounted in an airplane, one adjusted to take vertical photographs in the usual manner, the other two to shoot oblique photographs simultaneously, which extend to the horizon. The result is three photographs, which when put together, give a bird's-eye view from the horizon on one side of the airplane to the horizon on the other side.

*University of Oklahoma, Norman.



TROGON Aerial Photography

— OIL INDUSTRY'S NEWEST SURVEYING TOOL —

This group of three pictures is repeatedly shot along a line of flight at a predetermined interval, enabling a strip of land about 35 miles wide and several hundred miles long to be photographed in sufficient scale and overlap for a high degree of interpretation.

The inner side of the vertical plane of each oblique shot is perpendicular to the ground, and also overlaps a portion of the picture included in the shot by the vertical camera. These overlap areas in Fig. 1 are the portions where the inside lines from the oblique cameras fall within the outside edges of the vertical coverage.

The measurements and interpretations that can be derived from these three photographs are a part of the science of photogrammetry. This is not a new science, since its beginning dates back nearly 100 years to the experiments of a French engineer, Aimé Laussedat, and German scientists were experimenting with it for mapping purposes at the turn of the century. It received considerable impetus through the aerial photography work carried on by the U. S. Government in the thirties in connection with the agricultural and soil-conservation programs.

All previous progress in photogrammetry faded into insignificance compared to the advances made during World War II. The trimetrogon method was invented and developed by the Alaskan branch of the U. S. Geological Survey, under the direction of Lt. Col. Gerald Fitzgerald, and Col. Minton W. Kaye, director of photography, Army Air Force. It was used for photographic reconnaissance to develop information both for military intelligence and for map making in all parts of the world. Ultimately over 18,000,000 sq. mi. of the earth's surface were photographed by this method.

The technique used in taking trimetrogon pictures is not particularly different from any other aerial photographic project. A flight line is laid out on a definite course from a known point, and a continuous series of pictures snapped, with a substantial overlap along the line of flight. The major difference lies in the much smaller number of parallel flight lines that are required to cover a given area. This cuts down on the amount of work from the beginning of the process to the end, because more square miles are covered by fewer prints.

Due to the large area covered by the oblique photographs on each side of the vertical photograph (See Fig. 1), adjacent or parallel flight lines with trimetrogon may be as much as 35 miles apart. Covering the same territory completely with vertical photographs would require parallel flight lines not more than 3 to 4 miles apart. While the difference will vary with circumstances and local conditions, on an average trimetrogon will require only about one-tenth as many flight lines as complete vertical coverage. In actual practice, due to variations in overlap, etc., the number of photographic prints handled in trimetrogon coverage will be about one-fifth as

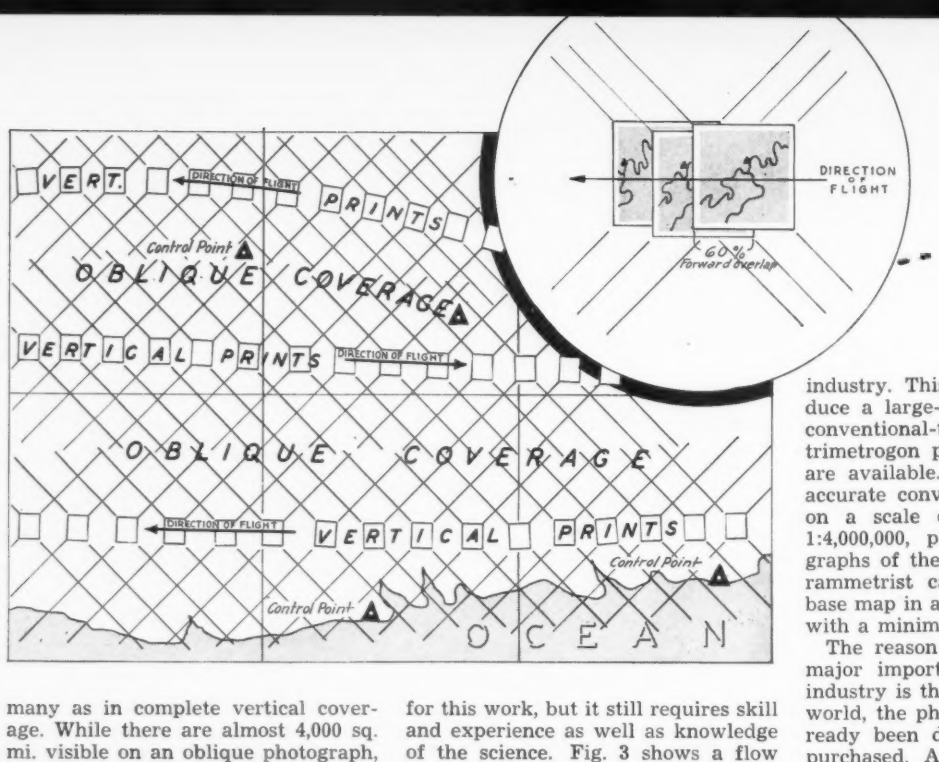


Fig. 2 — Flight-line diagram. Inset shows use of overlap photographs

many as in complete vertical coverage. While there are almost 4,000 sq. mi. visible on an oblique photograph, only about 250 sq. mi. can be used to any interpretative advantage.

Fig. 2 shows a sample layout in trimetrogon flight lines. It is in the amount of accurate information that can be derived from interpretation of oblique photographs that scientific progress in photogrammetry gains its greatest advantage. While not quite as accurate as the interpretation from vertical shots, for many purposes the loss in accuracy is either unimportant, or more than compensated for by the saving in time and reduction in cost for covering a given area.

The newly developed methods and instruments of photogrammetry come into use primarily in the work done on the prints. Many special instruments were devised during the war for this work, but it still requires skill and experience as well as knowledge of the science. Fig. 3 shows a flow diagram of the process, and the headings of the various stages are sufficient indication of its complexity.

Details of Process

Details of the process are of interest only to experts in that field; the important thing to oil men is that the end product is a finished topographic base map, of sufficient accuracy for a wide variety of uses. (See Fig. 4). The finished map also has the enormous advantage over a conventional type, that any given point on it can be supplemented with bird's-eye-view photographs of the area for the benefit of the user.

There is another application of photogrammetry that promises to be of major importance to the petroleum industry. This is the ability to produce a large-scale base map from a conventional-type small-scale map, if trimetrogon photographs of the area are available. If given a reasonably accurate conventional-type base map on a scale of 1:1,000,000, or even 1:4,000,000, plus trimetrogon photographs of the area, a skilled photogrammetrist can produce a 1:100,000 base map in a surprisingly short time, with a minimum of expense.

The reason this promises to be of major importance to the petroleum industry is that for large parts of the world, the photographic work has already been done and prints can be purchased. A substantial portion of the millions of square miles of trimetrogon photographs shot by the armed forces during the war are available for sale to any reputable person or concern, through a special commission set up in the Army Air Force. Therefore, large areas of the world can be studied for any specific purpose at a minimum of expense by an oil company. There is the additional advantage that mistakes on conventional base maps can be checked by comparison with the purchased photographs.

To the resultant large-scale topographic base map, geological data and interpretation obtained from study of the photographs can be added. If the geologist and photogrammetrist work in coordination, it can be done in one

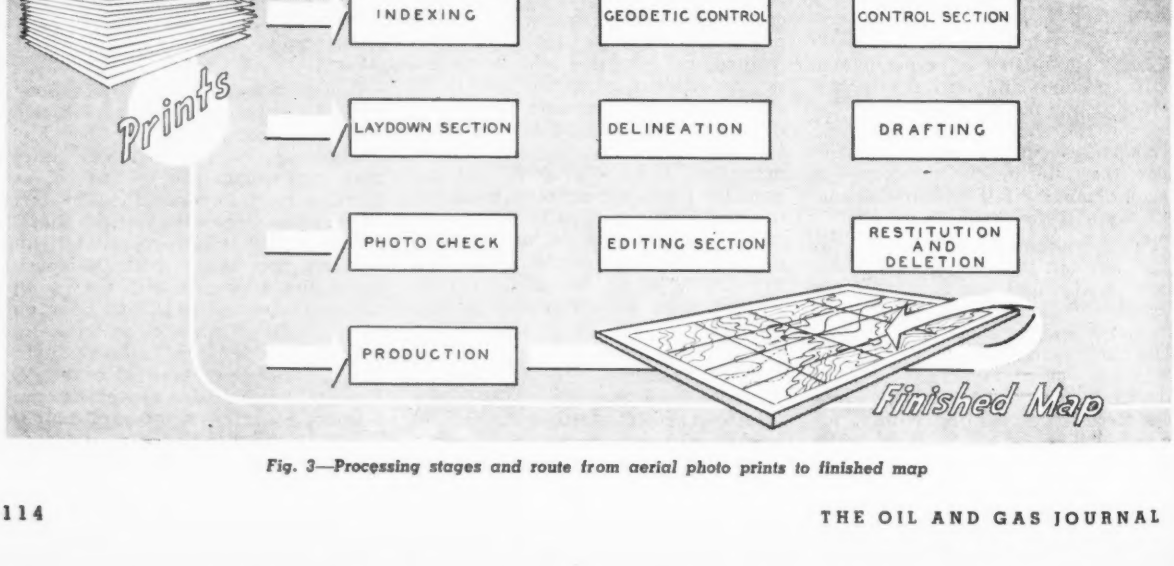


Fig. 3—Processing stages and route from aerial photo prints to finished map

operation. Many photogrammetrists with a knowledge of geology add a word of caution that interpretation of geology from any aerial photograph requires skill and at least some knowledge of the principles of photogrammetry. While this applies to all types of aerial photographs, it is especially true of the oblique portions of trimetrogon pictures.

Granted this cautionary qualification, the combination of topographic base maps on a conveniently large scale, plus trimetrogon photographs brings to the geologist at his desk, through stereoscopic examination, the geomorphology of the area he is studying.

Outcrops, structures, and all pertinent geological factors may be identified, interpreted, charted, and delineated on the map. Sizable areas may be studied as a regional geologic unit, since the geologist sitting at his desk with photographs and base map has almost the equivalent advantage of having his office in a helicopter hovering over each area he wishes to examine closely.

The geological department is not the only branch of oil operations that can find profitable employment for the combination of photographs and topographic base maps. Laying out pipeline rights-of-way from aerial photographs is of course commonplace nowadays. But road-construction planning is equally feasible. Since in some foreign countries, oil companies build more roads than do governments, there are many instances when important savings in time and money will result from use of this combination. Spotting the most convenient water-supply sources for drilling in advance of the ground crews; picking out favorable camp sites; locating convenient landing fields for planes; even spotting breeding places of insect pests that may cause trouble, are a few of the miscellaneous uses.

Another general field where trimetrogon photographs offer special advantages that will probably be useful to oil companies is in connection with construction of coastal shore facilities. Oil companies, particularly in foreign areas, are often faced with the problem of constructing their own piers and docks. Prior to the development of aerial-photographic techniques, mapping of coast lines was a major problem, and many otherwise accurate maps are faulty in this respect.

Shoreline features and shallow-water depths are particularly vulnerable to aerial photographic interpretation and during the war trimetrogon photographs were made of thousands of miles of coast lines. High and low tide lines can be spotted. Submerged shoals, sand bars, or even reefs have definite photographic patterns, and the fact that they are submerged is clearly evident in the pictures. The shelf of a shore can easily be discerned, and even interpreted to the extent of differentiating its composition as sand, mud, coral, or rock.

If an oil company intends to supplement available government trimetrogon prints with additional trimetrogon work of its own, the use of color photography will in general be advantageous. Full-color prints offer minutely defined detail with a clarity far beyond black and white. Using trimetrogon color photographs, heights, depths, and contours can be calculated to within a few feet. Black and white prints will be almost obsolete within 10 years, in the opinion of most photogrammetrists.

Trimetrogon techniques are still in their infancy and the future prospects appear to be almost unlimited. New processes and applications are constantly being evolved. It seems safe to predict that within the foreseeable future, all major map making throughout the world will be done by aerial photogrammetric methods.

For the petroleum industry, it appears quite likely that trimetrogon will become the foundation stone for all preliminary geological reconnaissance and exploration wherever large areas are involved. In addition it is certain to find supplemental applications in other branches of the industry.

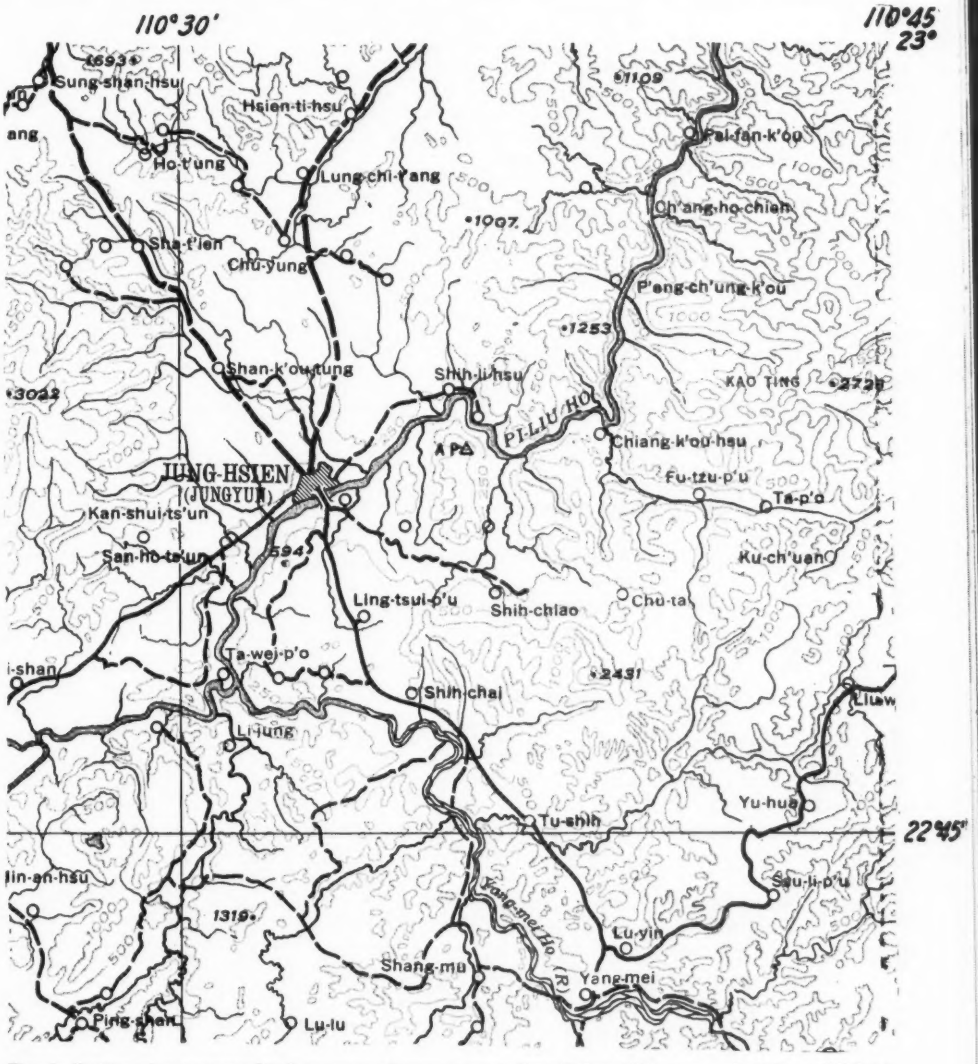


Fig. 4—Portion of a topographic base map of area around Jung-Hsien, China, compiled from AAF trimetrogon photography

Commercial T.C.C. Operations on Partially Vaporized Charge Stock

*by H. D. Noll, A. W. Hoge and D. M. Luntz**

THE Paulsboro, N. J., commercial T.C.C. installation of Socony-Vacuum Oil Co., Inc., has operated in a completely satisfactory manner since March 1946, with concurrent flow of catalyst and oil through the reactor charging both vaporized and partially vaporized stocks. During this period the vapor-catalyst disengager (which is necessary for concurrent flow) functioned efficiently, steam purging of the spent catalyst was accomplished more easily than on countercurrent flow, and distribution of the liquid and vapor charge through the reactor bed was uniform.

The commercial T.C.C. units built during the war were designed for the production of aviation gasoline employing countercurrent flow of oil actor. The production of maximum aviation gasoline dictated the use of light gas-oil charge stocks, which were well adapted to this type of design. Now, however, for postwar production of motor gasoline, economics favor the use of a heavier charge because of (1) the increased demand for virgin distillate fuels, and (2) the differential charge stock value.

In anticipation of the demand which would be made of T.C.C. units for cracking high-boiling and partially vaporized oils, a laboratory program was undertaken several years ago to develop a liquid-injection or mixed-phase technique for processing such stocks. Some of the results of this investigation were presented in a paper by Simpson, Eastwood, and Shimp.†

*Houdry Process Corp., New York.

†Simpson, Eastwood, and Shimp, "Liquid Charge Technique in T.C.C. Processing," The Oil and Gas Journal, 44 (29), 119-129 (1945).

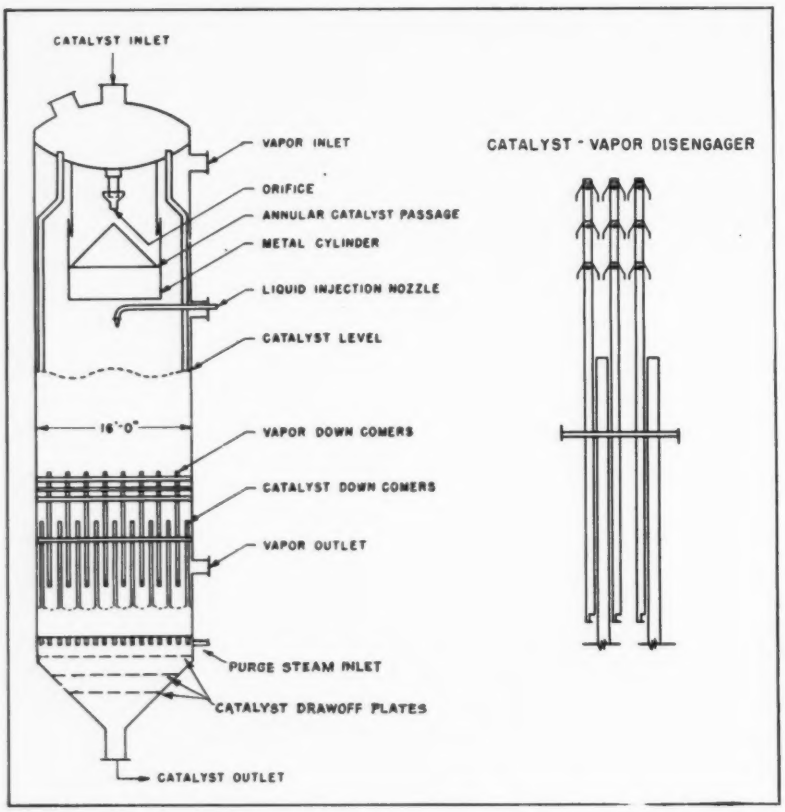


Fig. 1—T.C.C. reactor as used in mixed-phase concurrent flow at Paulsboro

vapors and catalyst through the re- Their work established the soundness of this technique as far as the catalytic reactions are concerned, when operating at the relatively low catalyst oil ratios employed in T.C.C. cracking. There remained, however, the solution of certain mechanical design problems in connection with commercial reactors before mixed-phase operations could become a reality in the refinery. Principally, it was necessary to have concurrent instead of countercurrent flow of oil vapors and catalyst through the reactor, and concurrent flow involves the use of an especially designed catalyst and vapor disengaging device in the lower section of the reactor. Accordingly, the necessary changes were made to the reactor of the Paulsboro T.C.C. unit early in 1946 and cracking operations were begun soon thereafter. This paper presents the results of some of these commercial concurrent flow operations.

Summary of Results

Process advantages

1. Mixed-phase, concurrent T.C.C. cracking is a practical operation by which partially vaporized oils may be processed efficiently.

2. Concurrent flow results in better utilization of the heat content of the inlet catalyst and oil stream. Because all of the heat in the inlet catalyst stream contributes to the reactor-bed temperatures, the temperature slope in a concurrent reactor more nearly approaches the ideal isothermal pattern. In a countercurrent reactor the heat content of the catalyst stream represented by the differential between catalyst inlet and reactor-bed temperature is lost to the effluent vapors.

3. Better heat utilization in concurrent flow reactors is also reflected in higher average reactor temperatures for given oil and catalyst inlet temperatures. The difference in favor of concurrent operation is about 50° F. for catalyst and oil inlet temperatures of 1,000° and 900° F., respectively, and for catalyst-oil ratios in the neighborhood of 2:1.

4. The higher average reactor temperature for concurrent flow results in higher-octane-number gasolines, the advantage for concurrent flow being one to two numbers C.F.R.-M.

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and two to three numbers C.F.R.-R. For equivalent average reactor temperatures there is no appreciable difference in yields or product quality between concurrent and countercurrent operations.

Mechanical efficiency

1. Carryover of catalyst fines to the synthetic crude tower is negligible.

2. The vapor-catalyst disengager operates in a completely satisfactory manner at reactor throughputs equivalent to 100 bbl. per day of hydrocarbon charge per square foot of reactor cross-section.

3. During the mixed-phase operation, analyses of spent catalyst samples taken across the first reactor catalyst drawoff plate showed uniform coke laydown. This indicates that all of the catalyst was functioning with equal effectiveness.

4. The pressure drop across the reactor and disengager is such that reactor seal legs in existing countercurrent T.C.C. units are adequate for concurrent operations.

5. There was no abnormal breakup of catalyst in the concurrent operations.

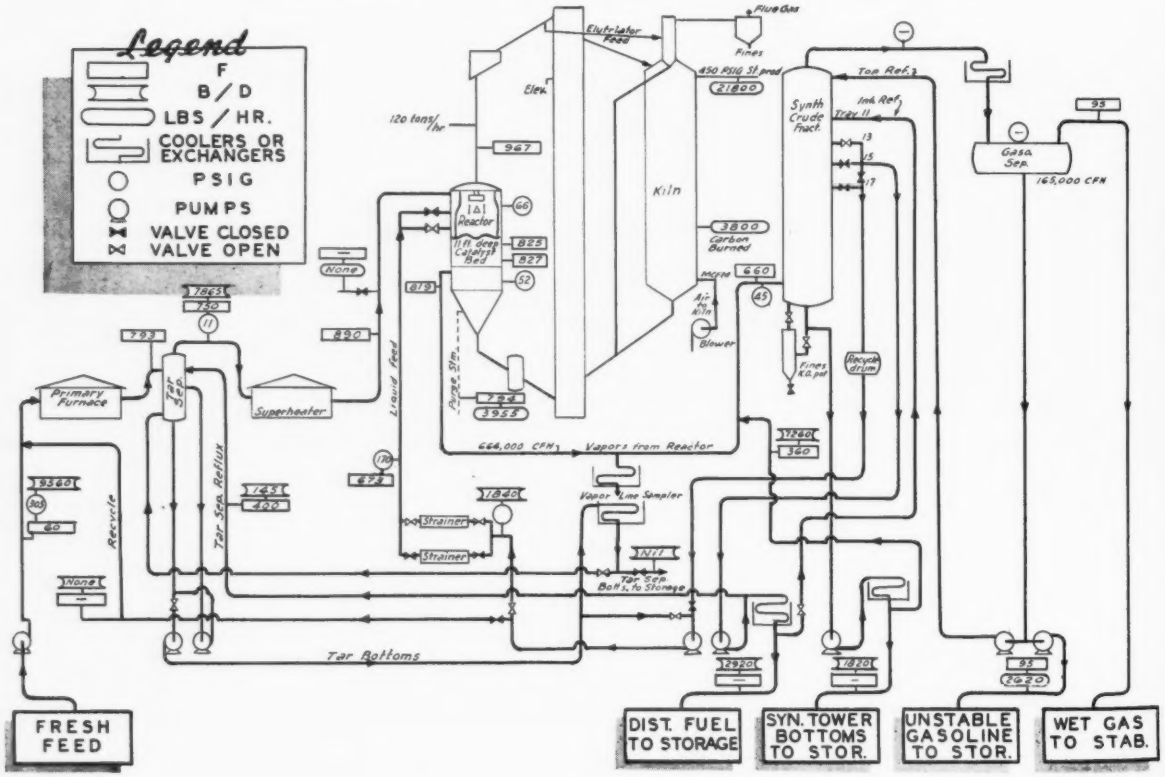
Description of Unit

The catalytic section of the Paulsboro T.C.C. unit is composed of a 16-ft. i.d. solid-bed reactor and a 10-zone, 10-ft. square, solid-bed kiln with a nominal catalyst circulation rate of 100 tons per hour. The plant was first placed in operation in 1944 and until the end of the war was utilized chiefly for retreating first-pass Houdry motor gasoline to high-quality aviation-base stock at charging rates in the neighborhood of 10,000 bbl. per stream day. Immediately following the war, the unit was operated without any design changes on gas-oil cracking for motor-gasoline production. Modifications were made early in 1946 and since that time various vaporized and partially vaporized charging stocks have been processed with concurrent flow of catalyst and oil through the reactor. All of these operations have been conducted on synthetic bead catalyst.

For the concurrent operations discussed in this paper, the reactor was revampel as indicated on Fig. 1. Briefly, (1) the external oil piping was reversed so that fresh vaporized charge entered the reactor at the previous oil-outlet nozzle and synthetic crude vapors left the reactor via the previous oil-inlet nozzle; (2) a vapor-catalyst disengaging device was installed in the lower section of the reactor utilizing part of the previous vapor distributing device to support the disengager; (3) the catalyst distributing system in the top of the reactor was revised to the extent that a portion of the catalyst (approximately 80 tons per hour) was introduced through a central pipe and over a conical deflector from which it fell in an annular curtain to the catalyst bed while the remainder of the catalyst was fed into a single peripheral row of feed pipes in the conventional manner; and (4) the reactor was equipped with a fog nozzle for injecting nonvaporized charging stocks. No other changes in design of the catalytic equipment were required. The existing spent-catalyst purging system was completely satisfactory and no vapor-distributing device was required in the top of the reactor.

The design and operation of concurrent-flow disengaging devices will be discussed in more detail later. At this point it will suffice to state that their primary function is to accomplish the disengagement of the total normal stream of synthetic crude vapors from a solid bed of catalyst without carrying catalyst particles out of the reactor. In the Paulsboro unit the disengager consists of three tiers of collecting channels spaced uniformly along a large number vertical vapor pipes as shown in Fig. 1. The vapor pipes have orifice openings under each channel for collecting a portion of the synthetic crude vapors at each level. Thus, vapors flowing down through the reactor bed pass up and under the channels into the ports of the vapor downcomers to a vapor-outlet chamber bounded on the top by a disengager tube sheet and on the bottom by a level of catalyst on the first catalyst drawoff plate of the re-

Fig. 2—Flow diagram of Paulsboro T.C.C. unit—concurrent mixed-phase operation, run 8-2



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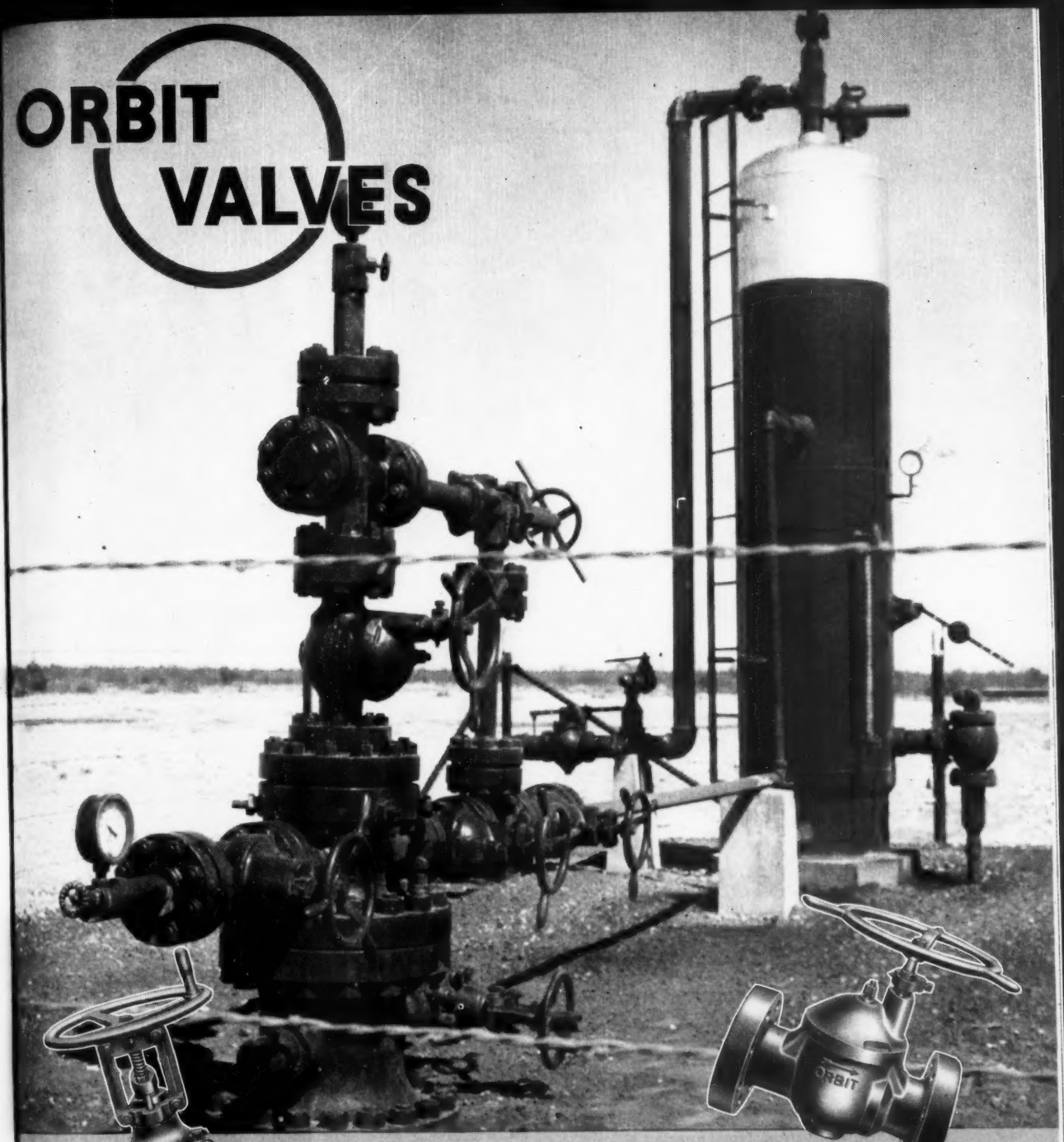

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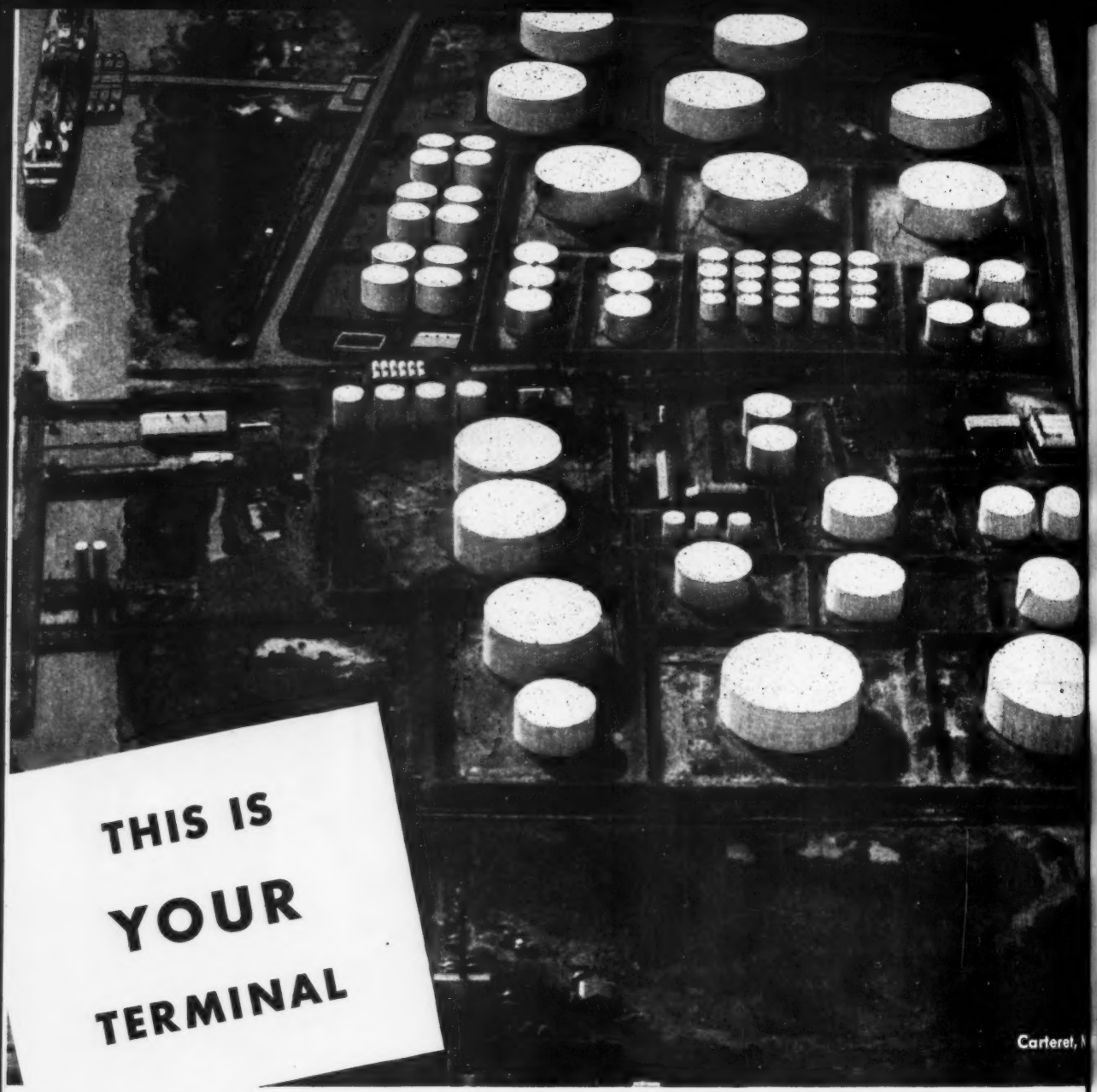

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actor. The vapor stream then flows from this chamber to the synthetic crude tower. Catalyst, also flowing down through the reactor, passes between the channels of the disengaging device to a disengager tube sheet from which it is conducted through catalyst downcomer pipes to the first drawoff plate of the reactor. Steam purging of spent catalyst is conducted in the same manner as for countercurrent operations, i.e., purge steam is admitted to the reactor below the first drawoff plate and passes countercurrently up through the catalyst.

Charging Stock Vaporized

On the light gas-oil operations the charging stock was completely vaporized in the primary furnace, the vaporized effluent from this heater being transmitted directly to the reactor or superheated in a secondary heater, if desired, to a predetermined reactor-inlet temperature. On the mixed-phase operations a tar separator was utilized to prepare the liquid and vapor charge streams. In the latter type of operation the partially vaporized effluent from the primary furnace was flashed in a conventional tar separator, the overhead vapor stream going to the secondary vapor heater and thence to the reactor via the vapor inlet nozzle. The tar separator bottoms liquid stream was then pumped to the reactor and distributed over the catalyst bed by means of the fog nozzle.

The internal catalyst feed system in the reactor was revamped as follows: Of the existing catalyst feed legs only the outer row of pipes was utilized and these were angled slightly to deliver catalyst as close as practicable to the reactor wall. The remainder of the feed legs were replaced by a single central inlet pipe equipped with a calibrated orifice so that catalyst flowed to the reactor bed at a fixed rate through this central pipe. (In the case of the mixed-phase test reported in this paper the rate through the central pipe was set at about 80 tons per hour.) As illustrated in Fig. 1, catalyst issuing from the orifice passed over an inverted metal cone, through the annular passage formed by the base of the cone and the cylindrical metal shield, and flowed to the bed as a freely falling curtain of catalyst. With the fog nozzle installed in the interior of this annular curtain and projecting outward an atomized oil spray, the liquid charge absorbed heat from this portion of the catalyst stream prior to entering the reactor bed.

With about 80 tons per hour of catalyst entering the reactor through the central pipe, the remainder of the total catalyst stream, some 30 tons per hour, entered through the peripheral feed legs. The flow capacity of the outer feed pipes was considerably above 100 tons per hour so that it would have been possible to stop the flow through the central pipe entirely without interfering with catalyst circulation. As is evident, the outer pipes also served to establish the level of catalyst in the reactor at a predetermined height of 11 ft. of active bed.

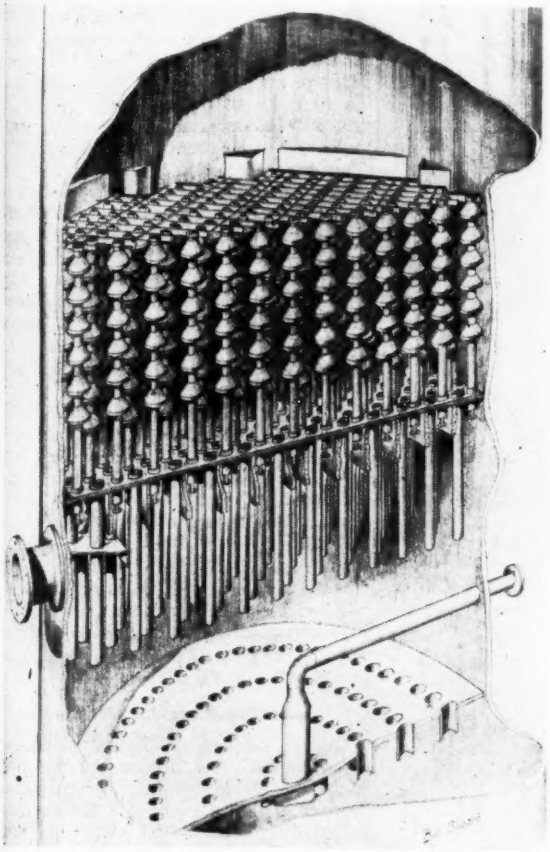


Fig. 3 — (Left) Artist's sketch of a section of a typical disengager design wherein channels have been replaced by inverted cones or cups

Fig. 4 — (Right) Model disengager device in operation

Commercial Vapor-Phase Operations

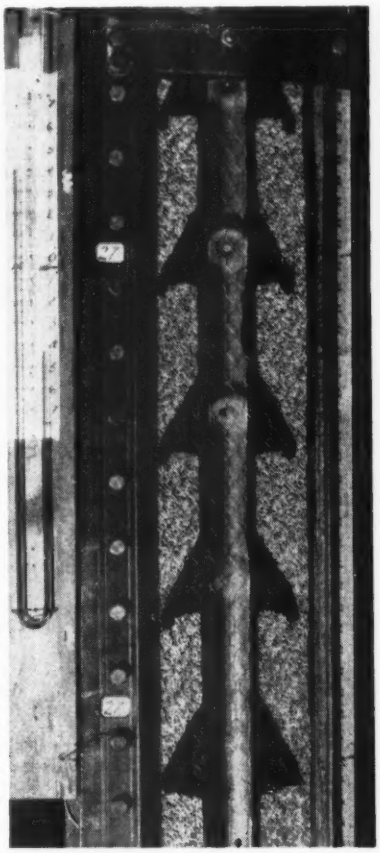
Table 1 is a summary of the data for two test periods on vapor-phase operation. The flow employed was as shown by Fig. 2, except that no liquid charge was used in the vapor-phase tests.

The fresh oil charge, together with a recycle stream from the synthetic crude tower, was vaporized in the primary furnace, superheated in a second heater to the desired temperature and then charged to the reactor. A small amount of the light distillate-fuel side stream from the fractionator was supplied to the tar separator from which it passed overhead to become a portion of the reactor vaporized charge. Oil vapors, after passing through the reactor, flowed to the synthetic crude tower where gasoline and gas were taken overhead. As mentioned above, part of the light distillate fuel was returned to the reactor via the tar separator while the remainder was taken as product. On completion of a test period, samples of all charge and product streams were collected and tested (and in some cases rerun) in the laboratory for determination of the final yields.

High Liquid Recoveries

The high liquid recoveries realized from both tests shown in Table 1 are characteristic of T.C.C. cracking. For these runs, with conversions of 67-68 per cent, the recoveries of C_5 and heavier material were 99-100 per cent.

Concurrent flow results in better



heat utilization than countercurrent flow. This arises from the fact that all of the heat content of the inlet catalyst stream contributes to the concurrent reactor bed temperature whereas in a countercurrent reactor essentially all of the differential heat in the catalyst stream above the average reactor temperature is lost to the effluent vapor stream. A comparison of reactor temperature patterns for the two types of flow shows lower maximum and higher minima temperatures for concurrent flow with the same average temperature in each reactor. Thus, concurrent flow provides a much closer approach to the ideal isothermal temperature pattern. Moreover, for the reason that catalyst heat is carried into the reactor, a higher average reactor temperature may be achieved at given oil and catalyst inlet temperature with concurrent flow. This means that existing countercurrent T.C.C. units may be converted to concurrent operation with substantial savings in fuel costs if it is desired to crack at the same average reactor temperature.

Good Heat Utilization

The excellent heat utilization for concurrent cracking is illustrated by the high conversion attained in Test A-2 when operating at only 1.22 catalyst-oil ratio. Such a low catalyst rate is not proposed as optimum for T.C.C. cracking but is merely included as an illustration of what can be accomplished by concurrent flow.

Analyses of different catalyst samples taken across the first reactor catalyst drawoff plate showed uniform coke laydown, indicating that oil and catalyst distribution, as well as purging, were completely satisfactory. The purging problem is simpler when employing concurrent flow because the material adsorbed on the catalyst is the highest boiling fraction of cycle stock rather than the highest boiling fraction of fresh charge, and thus has a lower molecular weight.

The carryover of catalyst fines to the synthetic crude tower was negligible at all times. Since in several tests (e.g., A-3) the flow of hydrocarbon vapors plus steam was equivalent to a flow of hydrocarbon vapors alone of approximately 100 bbl. per day per square foot of reactor cross-section, it was demonstrated that the vapor-catalyst disengager is effective at throughputs at least as great as will be encountered in commercial reactors. This means that the smallest existing reactors, i.e., 11 ft. 5 in. i.d., can process the equivalent of 10,000 bbl. per stream day of charge.

Since the reactor seal leg on the Paulsboro unit is similar in design to those installed on previous units and since the operation was satisfactory at throughputs of 100 bbl. per day per square foot of reactor cross-section, it was also demonstrated that catalyst seal legs in existing units are adequate for concurrent operation.

TABLE 1—PAULSBORO CONCURRENT UNIT

Run No.—	Vapor-phase operation A-2	Vapor-phase operation A-3	Mixed-phase operation B-2	
Type charge stock—	Paraffinic gas oil	Paraffinic gas oil	Heavy Iowa gas oil	
Catalyst—	36.6 A.I. beads	35.9 A.I. beads	35.6 A.I. beads	
Fresh feed, bbl. per day	9,127	7,895		
Fresh vapor feed, bbl. per day			7,720	
Fresh liquid feed, bbl. per day			1,840	
Lt. dist. recycle (tar sep. reflux), bbl. per day	1,190	847	145	
Recycle, bbl. per day	5,778	4,204		
Total feed, bbl. per day	15,975	12,946	9,705	
Process steam, lb. per hour	Nil	8,800	Nil	
Process steam, per cent weight total charge	Nil	5.4	Nil	
Purge steam, lb. per hour	3,070	2,405	3,955	
Catalyst rate, tons per hour	108	122	190	
Space velocity, total feed, V./hr./V.	1.69	1.37	1.03	
Catalyst-oil ratio, V./V.	1.22	1.71	2.25	
Oil vapor inlet temperature, °F.	866	855	890	
Oil liquid inlet temperature, °F.			673	
Oil vapor outlet temperature, °F.	842	821	819	
Catalyst inlet temperature, °F.	955	900	967	
Pressure (inlet), psig.	10.7	10.7	6.6	
(outlet), psig.	8.4	7.3	5.2	
Carbon burned, lb. per hour.	4,000	4,800	3,800	
Conversion, per cent volume	67.6	67.1	49.9	
Yields on fresh feed:				
10-lb. R.v.p. gasoline (90% at 375° F.), % vol.	55.5	53.5	45.5	
C_5 free gasoline (90% at 375° F.), % vol.	52.7	50.5	42.6	
Cycle stock, % vol.	32.4	32.9	50.1	
C_3H_6, % vol.	3.9	3.9	2.7	
i-C_4H_{10}, % vol.	7.6	8.5	4.7	
n-C_4H_{10}, % vol.	3.2	3.0	2.0	
Total C_4's, % vol.	14.7	15.4	9.4	
Liquid recovery (C_4 and heavier), % vol.	99.8	98.8	102.1	
Dry gas, % wt.	6.2	5.8	3.9	
Coke, % wt.	3.5	5.3	3.0	
			Vapor feed	Liquid feed
Inspections of fresh charge:				
Gravity, °A.P.I.	34.1	33.8	27.4	20.8
A.S.T.M. distillation, vacuum assay:				
I.b.p., °F.	395	540	472	555
10 per cent	511	552	548	659
50 per cent	590	612	640	864
90 per cent	672	701	817	Crkd
End point	714	730		*1,050+
Aniline point, °F.	172	170	155	187
Sulfur, wt. %	0.32	0.29	0.31	
Conradson carbon, wt. %	0.02		0.01	*1.0
Inspections of 10-lb. R.v.p. gasoline:				
Octane number, C.F.R.-M., clear	80.0	79.3	79.8	
Octane number, C.F.R.-M., +1 cc. TEL	84.6	83.5	84.2	
Octane number, C.F.R.-M., +3 cc. TEL	87.9	88.2	87.1	
Octane number, C.F.R.-R., clear	89.9	88.2	88.4	
Octane number, C.F.R.-R., +1 cc. TEL	94.4	92.5	93.7	
Octane number, C.F.R.-R., +3 cc. TEL	97.1	95.5	96.2	
Sulfur, wt. %	0.017		0.041	
Cu. dish gum, Mg. per 100 cc.	6	4	10	
O_2 bomb induction period, hr.:min.	19:15	>20:00	>20:00	

*Estimated.

Commercial Mixed-Phase Operations

Table 1 presents the results of a test period obtained while charging vapor and liquid simultaneously to the reactor. Fig. 2 is a material-flow diagram with quantities of each stream and operating conditions indicated. Fresh charge was preheated to 739° F. and flashed in a tar separator, 81 per cent going overhead. The tar separator overhead (including a small amount of light distillate recycle) was superheated to 890° F. and charged to the reactor at the vapor inlet. The tar separator bottoms were charged to the reactor as a liquid (at 673° F.) through the fog nozzle. Reactor effluent vapors were processed and final yields determined as described in connection with the vapor-phase operations.

The low coke and dry-gas yields (3.0 and 3.9 weight per cent respectively) from the mixed-phase test are noteworthy, especially when it is considered that 45.5 per cent of 10-lb. R.v.p. gasoline was made. Also of considerable interest is the 102 per cent liquid recovery. Pilot-plant runs on stocks which can be completely vaporized show no significant difference in product distribution or coke laydown between mixed-phase and vapor-phase operations.

Carbon Concentration

During the concurrent mixed-phase tests the carbon concentration on the spent catalyst was relatively uniform, indicating that all of the catalyst was functioning with equal effectiveness.

Carbon concentrations varied as follows:

Sampling location (first catalyst drawoff plate)	Distance from shell (on center line, in.)	Wt. % carbon on catalyst
1	6	3.0
2	18	2.6
3	30	2.4
4	42	2.3
5	54	2.4
6	66	2.9
7	78	2.5
8	90	2.7

Carryover of catalyst fines to the synthetic crude tower was negligible. Throughout the operation with mixed-phase feed, purging was accomplished in a very satisfactory manner and there was no abnormal breakup of catalyst. The pressure drop across the catalyst bed and disengager was only 1.4 psi.

In view of the results of the mixed-phase tests, it is concluded that mixed-phase concurrent T.C.C. cracking is a practical operation by which partially vaporized oils may be processed efficiently.

Pilot-Plant Comparison of Concurrent and Countercurrent Cracking Results

Table 2 is a summary of the results of three runs made in the laboratory investigation of concurrent processing. These particular tests were made to evaluate the differences between concurrent and countercurrent operations.

Concurrent flow gives a higher average reactor temperature for given oil and catalyst inlet temperatures because of better heat utilization (see Runs 2053-T and 2054-T). The difference between concurrent and countercurrent operation is about 50° F. for catalyst and oil-inlet temperatures of 1,000° and 900° F., respectively, and for catalyst-oil ratios in the neighborhood of 2:1. The higher average reactor temperature results in higher-octane-number gasolines, the advantage for concurrent flow being one to two numbers C.F.R.-M. and two to three numbers C.F.R.-R. However, for a given average reactor temperature, there is no appreciable difference in yields or product quality between the two methods of processing (see Runs 2055-T and 2054-T).

Comparison of Commercial and Pilot-Plant Cracking Results

Table 3 is a comparison of pilot-plant and commercial results obtained for concurrent cracking. The data show good agreement for the vapor-phase operations. However, in the case of the mixed-phase charge stock there are somewhat higher yields shown for the pilot-plant test. The higher yields in the latter test are associated with the higher cracking temperature (836° F. oil outlet vs. 819° F.) which may have been due to the fact that the oil was charged in one stream instead of in separate liquid and vapor streams.

Mechanical Features of Mixed-Phase Concurrent Reactor

The mechanical changes required for the conversion of a standard countercurrent reactor to a mixed-phase concurrent reactor have been outlined in a previous section. Of the new devices installed, perhaps the two most significant are the catalyst-vapor disengager and the liquid-injection nozzle. The other changes, that is, modification of the catalyst-distributing system, reversal of the oil piping, etc., are of relatively minor importance.

The development of the disengager to its present form is the result of extensive experimental work and reflects a thorough knowledge of the fundamental laws governing catalyst and vapor flow. Referring to Fig. 3, which is an artist's sketch of a section of a typical disengager design wherein the channels previously referred to have been replaced by inverted cones or cups, it can be seen that sufficient free area of the horizontal cross-section of the disengager must be provided for a normal downward flow of catalyst; in the case of the Paulsboro unit the nominal rate is 100 tons per hour. At the same time, if all of the vapor were to be removed at the first level of outlet ports, vapor velocities would be so high at normal charge rates that catalyst particles would be carried out of the reactor and into the distillation equipment. Thus, it is necessary to remove vapors from the catalyst bed at successive levels of outlet ports so that the vapor flow and corresponding pressure gradient at any one level do not exceed well established critical values. Obviously, as the volume of synthetic crude vapors increases, either by virtue of increased charge rate to the reactor or increased depth of cracking of the charge, more levels of vapor outlet ports must be provided. Thus, the vapor-catalyst disengaging device is designed for the maximum catalyst circulation rate as well as the maximum effluent vapor flow rate to be expected on a given T.C.C. installation.

Fig. 4 is a photograph of a model disengager device in operation. This view shows very clearly the configuration assumed by the catalyst as it flows through a disengager section and also illustrates that at the point of vapor disengagement vapor and catalyst are actually flowing countercurrently. Hence, the limiting flow

TABLE 2—COMPARISON OF ONCE THROUGH CONCURRENT AND COUNTERCURRENT OPERATIONS

Type charge stock—	East Texas gas oil		
Run No.—	2053-T	2055-T	2054-T
Catalyst—	30 A.I. clay		
Flow—	Concurrent		Countercurrent
Space velocity, V./hr./V.	0.81	0.82	0.78
Catalyst-oil ratio, V./V.	2.05	1.98	2.03
Oil inlet temperature, °F.	900	840	900
Catalyst inlet temperature, °F.	1,000	885	1,000
Average reactor temperature, °F.	905	850	850
Steam, per cent wt. fresh feed	9.7	9.2	10.2
Pressure, psig.	10	10	10
Carbon burned, lb. per hour per 10,000 bbl. per day feed	4,040	3,020	3,540
Conversion, per cent volume	50.3	45.2	45.5
Yields on fresh feed:			
10-lb. R.v.p. gasoline (90% at 370° F.), % vol.	37.9	36.8	36.5
C_4 free gasoline (90% at 370° F.), % vol.	35.8	34.8	34.2
Cycle stock, % vol.	49.7	54.8	54.5
C_4H_8, % vol.	4.9	3.3	4.3
i-C_4H_{10}, % vol.	5.8	5.7	4.8
n-C_4H_{10}, % vol.	1.7	1.4	1.2
Total C_4's, % vol.	12.4	10.4	10.3
Liquid recovery (C_4's and heavier), % vol.	97.9	100.0	99.0
Dry gas, % wt.	6.2	4.6	5.0
Coke, % wt.	3.3	2.5	2.9
Inspections of fresh charge:			
Gravity, °A.P.I.	34.6	34.6	34.6
Distillation (vacuum assay):			
I.b.p., °F.	400	400	400
10 per cent	483	483	483
50 per cent	562	562	562
90 per cent	671	671	671
End point	743	743	743
Aniline point, °F.	163	163	163
Sulfur, % wt.	0.11	0.11	0.11
Inspections of 10-lb. R.v.p. gasoline:			
Octane number, C.F.R.-M., clear	80.1	78.7	78.7
Octane number, C.F.R.-M., +1 cc. TEL	84.2	83.4	83.2
Octane number, C.F.R.-M., +3 cc. TEL	87.5	87.3	87.1
Octane number, C.F.R.-R., clear	91.0	88.6	88.5
Octane number, C.F.R.-R., +1 cc. TEL	95.1	92.1	92.3
Octane number, C.F.R.-R., +3 cc. TEL	97.8	95.4	94.4
Sulfur, wt. %	0.053	0.057	0.061

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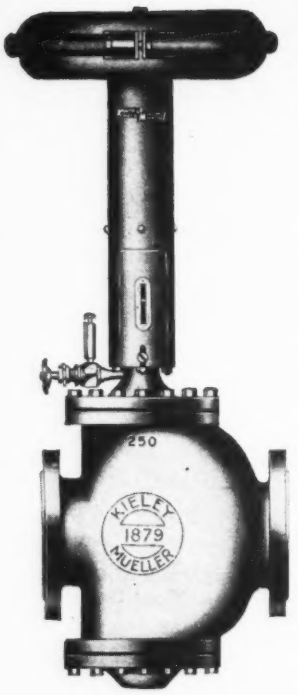

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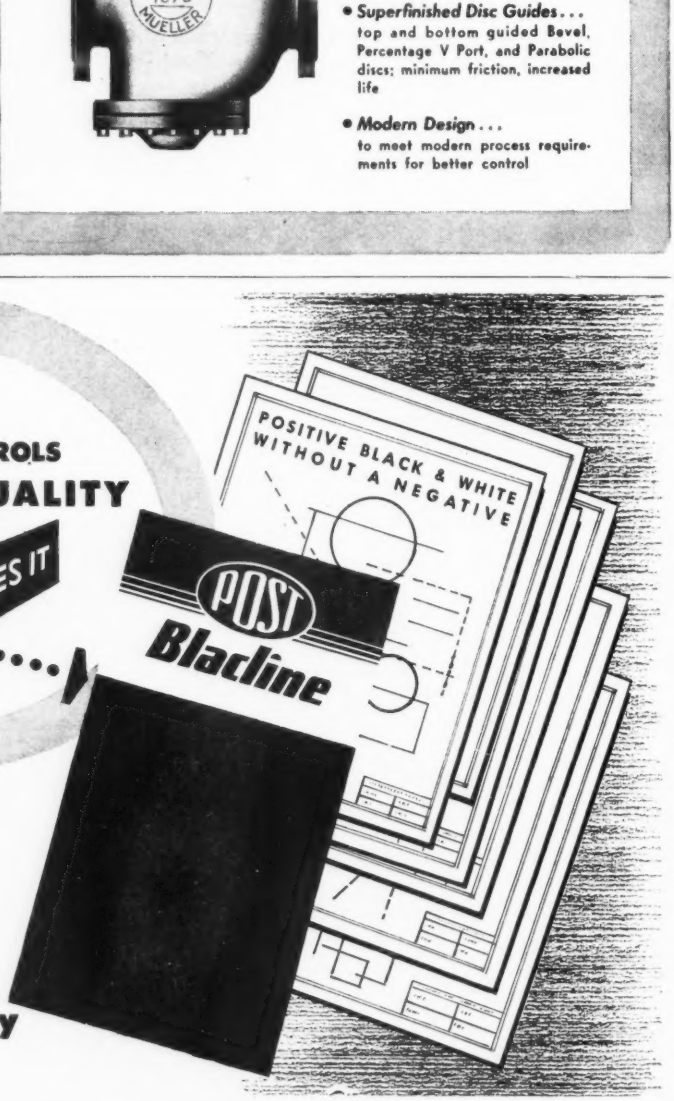

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TABLE 3—COMPARISON OF COMMERCIAL AND PILOT-PLANT T.C.C. CRACKING

	Vapor-phase operations		Mixed-phase operations	
Run No.—	A-2	7C-376	B-2	7C-375
T.C.C. unit	Paulsboro	Pilot plant	Paulsboro	Pilot plant
Reactor charge—	T.S.O. 57.2% paraffinic G.O. 42.8% recycle	T.S.O. Ex. A-2	98.5% heavy Iowa G.O. 1.5% recycle	Heavy Iowa G.O.
Catalyst—	36.6 A.I. beads	36 A.I. beads	35.6 A.I. beads	36 A.I. beads
Space velocity (total), V./hr./V.	1.69	1.62	1.03	1.03
Catalyst-oil ratio, V./V.	1.22	1.26	2.25	2.17
Process steam, % wt. reactor charge	Nil	Nil	Nil	Nil
Oil inlet temperature, °F.	866	866	827 (calc.)	833
Oil outlet temperature, °F.	842	834	819	836
Catalyst inlet temperature, °F.	955	955	967	972
Pressure, psig.	9.5	10.0	5.9	10.0
Yields on reactor charge:				
10-lb. R.v.p. gasoline (90% at 375° F.), % vol.	31.7	30.2	44.9	46.4
C_4 free gasoline (90% at 375° F.), % vol.	30.1	28.8	42.0	43.6
Cycle stock, % vol.	61.3	61.9	50.8	44.6
C_3H_8, % vol.	2.2	2.3	2.7	3.1
i-C_4H_{10}, % vol.	4.4	5.3	4.6	8.1
n-C_4H_{10}, % vol.	1.8	1.7	2.0	2.1
Total C_4's, % vol.	8.4	9.3	9.3	13.3
Liquid recovery (C_4 and heavier), % vol.	99.8	100.0	102.1	101.5
Dry gas, % wt.	3.5	3.4	3.8	5.2
Coke, % wt.	2.0	1.9	3.0	3.8
Inspections of 10-lb. R.v.p. gasoline:				
C.F.R.-M., clear	80.0	79.6	79.8	80.8
C.F.R.-M., +1 cc. TEL	84.6	84.0	84.2	84.8
C.F.R.-M., +3 cc. TEL	87.9	85.8	87.1	87.9
C.F.R.-R., clear	89.9	88.6	88.4	90.8
C.F.R.-R., +1 cc. TEL	94.4	92.9	93.7	95.3
C F.R.-R., +3 cc. TEL	97.1	95.2	96.2	97.6

and pressure drop relationships involved at each of these off-take points are in reality established by countercurrent flow laws. Another interesting observation made in the development of the disengager was the fact that not only the disengager area (the horizontal cross-sectional area included beneath the disengaging cups), but also the disengaging periphery are significant factors in the operation of the device. In other words, exclusive of such factors as ease of fabrication and structural strength, the optimum disengager design provides for maximum disengaging area and also a maximum cup or channel perimeter bounding that area.

The vertical spacing of disengaging levels is determined by the height required for uniform catalyst flow. Also, it has been found that staggering the drawoff ports on successive rows of vertical vapors greatly improves the catalyst flow. Actual observation of a model disengager incorporating all of the special design features enumerated above has indicated that catalyst flow downward is absolutely uniform; there are no stagnant areas or pockets of catalyst which do not flow out of the reactor with the bulk of the catalyst, and there is no carryover of catalyst particles in the effluent vapor stream.

Having flowed past the primary disengaging zone, catalyst is conducted via catalyst downpipes to the main vapor-outlet chamber of the reactor, through the purge zone, and thence out of the reactor by way of the conventional drawoff system. Vapors collected in the tubes in the primary disengaging zone are conducted also to the main vapor outlet chamber where disengagement of any vapor still associated with the catalyst stream occurs. The purge steam introduced in the normal manner below the first catalyst drawoff plate of the reactor is collected in the reactor vapor outlet chamber and flows with the synthetic crude vapors to the distillation section. The commercial runs on nonvaporized stocks at the Paulsboro unit were made with a catalyst residence time in the so-called purge zone only 65 per cent as great as normally provided on vapor-phase operations without any difficulty in purging whatsoever and at the same rate of injection of purge steam.

The pressure atomizing nozzle used for the injection of the nonvaporizable portion of the charging stock was located approximately as illustrated in Fig. 1. This nozzle was a conventional pressure atomizing nozzle with a 90° impingement of paired liquid streams. It was designed to project a fog of atomized liquid charge onto the falling annular curtain of catalyst. As previously stated, the heat content of the central catalyst inlet stream was used in this way to heat the liquid charge before entering the reactor bed proper. The actual elevation of the fog nozzle above the top level of the bed was approximately 6 ft. It is obvious, however, that the precise elevation of the fog nozzle is a function of the particular design of nozzle employed, in all cases the aim being to have the atomized liquid impinge upon the annular curtain of catalyst at a point slightly above the level of the catalyst bed.

The fog nozzle employed on the Paulsboro unit had a capacity of 75 g.p.m. hot volume and operated at pressures in the neighborhood of 100 psig. It was inserted through a nozzle on the side of the reactor and, by means of a stuffing-gland arrangement could be removed for inspection or for changing to straight vapor-phase operation without shutting down the reactor.

Future Developments

It should be mentioned that in revamping the Paulsboro unit to conduct the concurrent operations, it was found that the job was simpler if the present tar separator were left in the feed circuit. However, a tar separator is not essential as the heavy-oil feed may be charged in a mixed phase, thus eliminating the necessity for such a tower unless the stock contains asphalt or inorganic salts.

At the present time, the Paulsboro unit is operating with mixed-phase feed introduced as one stream through a spray nozzle in the top section of the reactor. Typical yields realized from such operations are given below and compared with those obtained from a pilot-plant test made under similar conditions.

It is interesting to note that the gasoline yield was higher and coke yield lower for the large-scale operation. The Paulsboro unit has been running for several weeks with mixed-phase feed introduced as one stream and all results have been entirely satisfactory.

In view of the favorable results obtained from the Paulsboro unit, the decision has already been made to convert a considerable number of commercial reactors to concurrent flow. The cost of this conversion is exceedingly small, being only about 1 per cent of the initial investment for the plant.

Unit—	Paulsboro	Pilot plant
Charge stock (paraffinic type)	33% deasphalted heavy gas oil (1,000° F. at 50%) 67% light gas oil (731° F. end point)	
Yields:		
C_4 free gasoline, per cent volume	42.8	39.5
Cycle stock, per cent volume	47.5	48.1
Coke, per cent weight	3.8	5.5

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Continuous Process for ALUMINUM GREASES

by H. G. Houlton, M. Sutton, and H. W. Bevarly

SLURRY of soap and oil is made in tanks in vacuo to eliminate air entrainment, moved by booster pump with spring-loaded bypass to a steam-jacketed Votator, at 300° F. or higher and then cooled in another Votator section and cooled to a predetermined gelling temperature — in a period ranging from 10 to 180 seconds. It is passed into insulated gel tanks where it gels isothermally. It is then worked and packaged. For any given grease, a transition temperature exists above which the grease will not gel when stored isothermally. With a transition temperature of 180° F., it was shown that as the grease leaves the cooler below that temperature, the gel which forms increases rapidly in strength until at about 140° F. the critical temperature is reached and at which maximum yield is obtained. Grease, therefore, should be worked as near its critical temperature as possible.

The authors, of The Girdler Corp., presented this paper at the recent meeting of the National Lubricating Grease Institute at Chicago. Other papers are digested on page 135 of this issue.

ALUMINUM grease, up to the present, generally has been made batchwise. Oil and aluminum soap were mixed and heated to about 275° to 310° F. in an open kettle of about 4,000 lb. capacity, until the soap went into solution. Hot grease was then poured into pans for cooling and gelling. The pans held about 30 to 100 lb. They were stacked 10 to 20 high in tiers. The cooling rate was generally controlled and took about 12 hours. After the grease gel had set, it was dumped from the pans into a hopper; and then pumped through some type of grease "worker" into package. A worker was used to produce a grease of fairly stable consistency. Such workers consisted of multiple screens, vacuum centrifuges, mills, and similar equipment.

An element in the batch process which was sometimes a problem was the nonuniform consistency of the grease when cooling and gelling took place simultaneously in pans. The grease around the edges of the pan cooled rapidly and formed a hard gel, while at the center of the pan the grease cooled slowly and formed a soft gel. The worker was used to produce a fairly stable consistency by breaking the false set of the gel and by thoroughly intermixing the various consistencies resulting from pan cooling. Such factors were eliminated and did not appear as problems when the continuous process was employed.

This paper presents plant data covering a continuous process manufacturing aluminum grease at the rate of 1,500 to 2,000 lb. per hour. The proc-

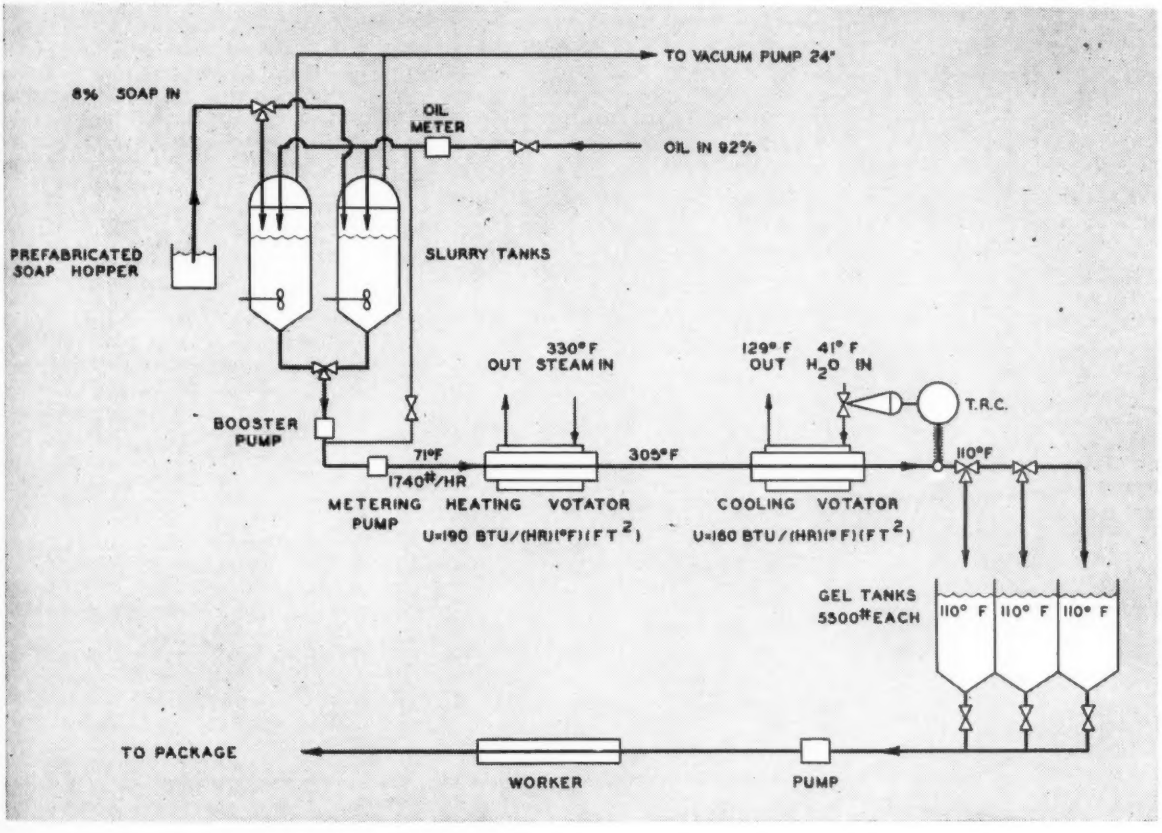

Fig. 1—Flow sheet of the continuous process

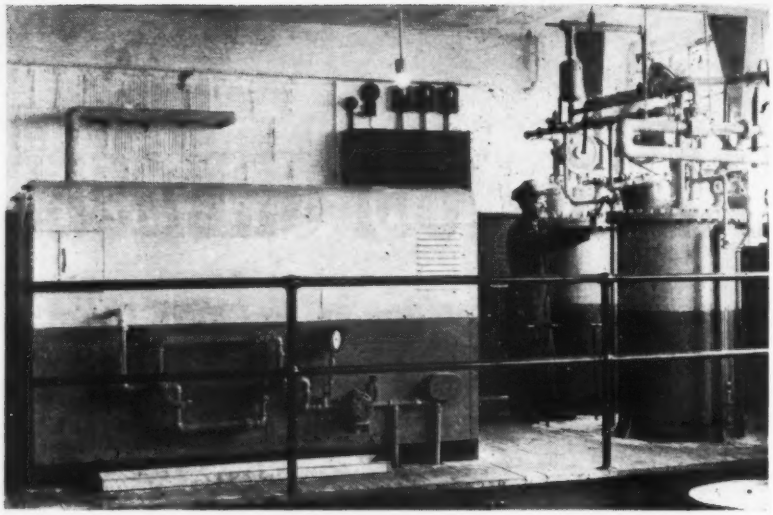

Fig. 2—Plant installation showing oil-soap slurry tanks

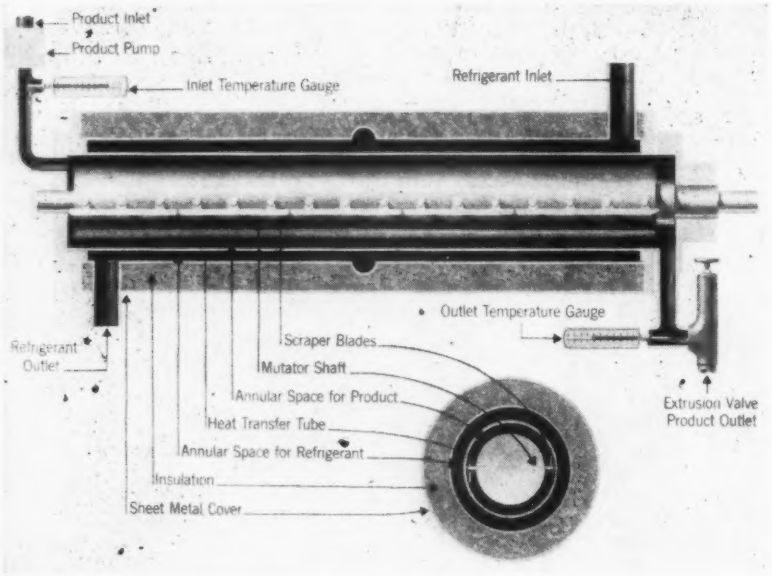

Fig. 3—Cutaway view showing Votator construction

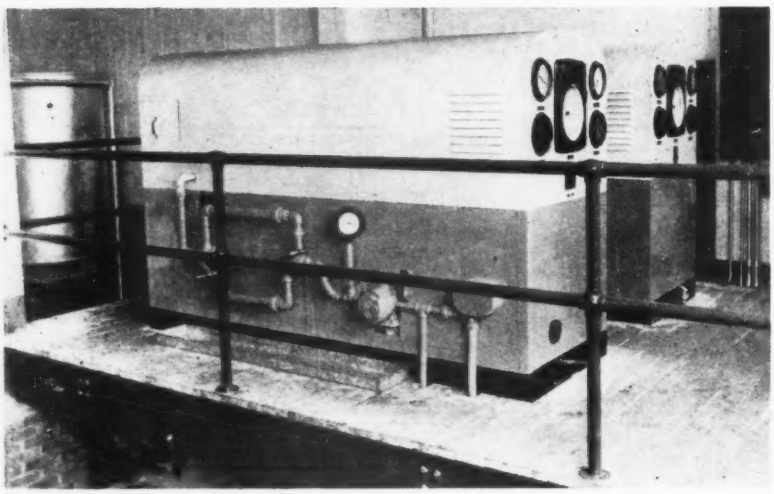

Fig. 4—Plant installation showing heating and cooling Votators

ess is radically different from batch operation in many respects.

Fig. 1 shows a flow sheet of the continuous process. An oil-and-soap slurry is made under about 22-26 in. of vacuum. The slurry is pumped at approximately 1,500 lb. per hour through a heating Votator to dissolve the soap; through a cooling Votator to cool the grease; and then, into insulated gel tanks holding about 5,500 lb. each where the grease was gelled isothermally. The uniformly gelled grease is then pumped from the gel tank through a worker to break down the false set of the grease to a constant consistency. Since the grease is uniform in consistency in the gel tanks, intermixing is not necessary.

Slurry Preparation

It was found that slurries of soap and oil made in open tanks incorporated a considerable amount of air. Most of the air was entrained with the soap. With light-viscosity oils a slurry could be made in open tanks and pumped continuously through a deaerator to the heating Votator. However, with heavy oils the mixture became too difficult to deaerate in this manner. Consequently, soap and oil slurries were prepared under vacuum in order to prevent air entrainment.

For continuous operation two vacuum slurry tanks are provided. This allows time for charging one tank while pumping from the other. Metered quantities of oil are pumped into the vacuum tank, deaerated before soap addition, and kept free from air while mixing. Weighed quantities of soap are drawn into the tank by vacuum. Thus deaerated soap contacts deaerated oil. The tanks are fitted with an agitator, single-stage steam jet ejector, soap trap, low-level alarm, and liquid-level indicator.

The oil-and-soap slurry is drawn from the vacuum slurry tank by means of a booster pump and delivered to the suction of the Votator feed pump at constant head pressure. The booster pump is fitted with a spring-loaded bypass valve to return back the excess slurry to the slurry tank. Fig. 2 shows two of these vacuum slurry tanks.

Heating.—The heating unit used is a steam-jacketed Votator, a cross-section of which is shown in Fig. 3. In the space between the cover and jacket wall is insulation. Between the jacket wall and the heat-transfer tube is the heat-transfer medium (which, in this case, is steam). Between the heat-transfer wall and the rapidly rotating shaft is the narrow annular space for the slurry. The shaft is equipped with blades which scrape the slurry from the inside surface of the heat transfer wall and violently intermix this heated layer of slurry with the main body of slurry in the narrow annular space of the Votator, thus uniformly heating and

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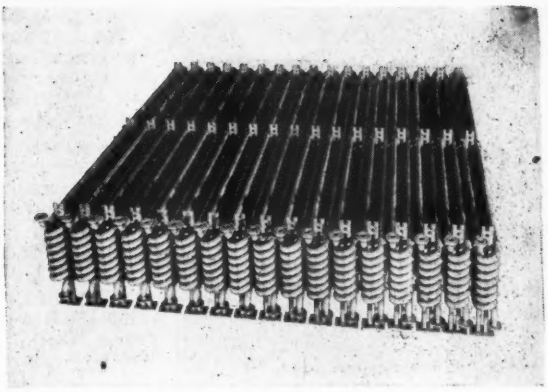

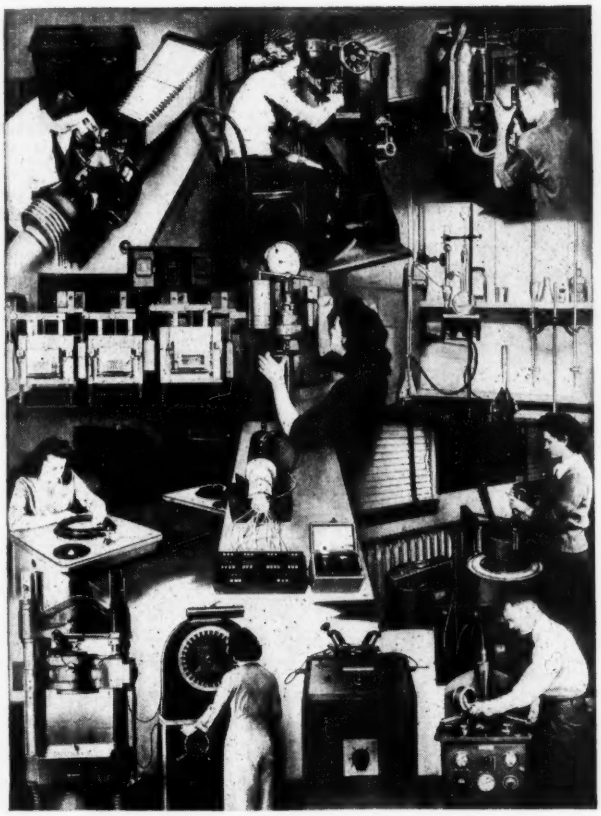

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Fig. 5—Plant view showing cooled aluminum stearate grease flowing into insulated gel tanks

thoroughly mixing the oil and soap.

An instrument panel is provided on the control end of the unit. It is fitted with a thermometer to indicate product inlet temperature; a recording thermometer to record product outlet temperature; a gage to indicate steam pressure; a gage to indicate pump discharge pressure; and a signal light to indicate low level on slurry tanks.

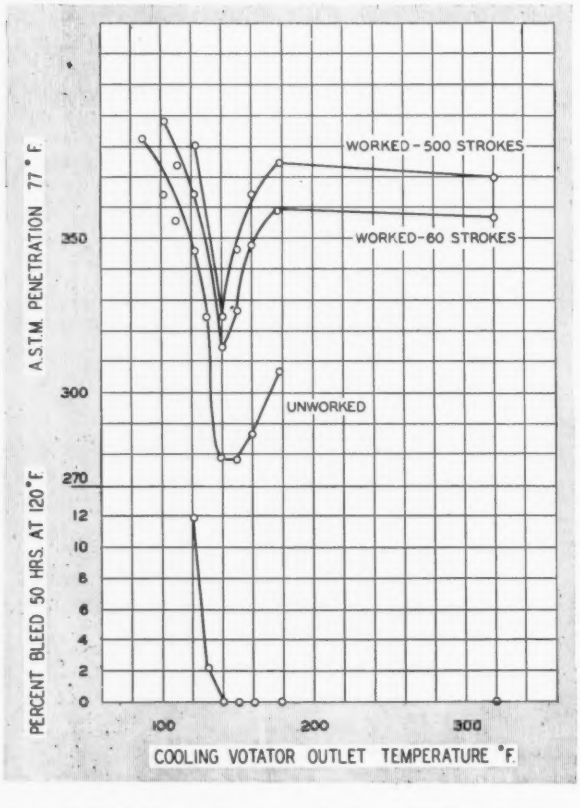
The slurry of oil and soap is pumped through the narrow product space, while being subjected to violent agitation, in from 10 to 180 seconds, and the temperature raised in this period of time to approximately 300° F. in order to dissolve the soap in the oil.

Cooling.—The hot grease then flows continuously through a cooling Votator of similar design and cools to a predetermined critical gelling temperature in about the same time, 10 to 180 seconds. This Votator is equipped with recording controller in order accurately to control the temperature of the grease going to the gelling tanks. The cooling step is one of the most important and critical steps of the process. Fig. 4 shows the heating and cooling Votators. Table 1 gives a summary of the heat-transfer opera-

TABLE 1—HEAT DATA ON CONTINUOUS GREASE MANUFACTURE

	Grease	Power	Steam	Water
Heating stage:				
Lb./hr.	1,740			
Inlet, °F.	71		†330	
Outlet, °F.	305			
B.t.u./hr.	245,000	12,000	*233,000	
Specific heat, C_p	0.6			
Over-all coefficient U	190			
Cooling stage:				
Lb./hr.	1,740			2,700
Inlet, °F.	305			41
Outlet, °F.	110			129
B.t.u./hr.	204,000	32,000		235,000
Specific heat C_p	0.6			1
Overall coefficient U				157
Film coefficient h	420			*317
Velocity ft./sec.				1.12
Re				11,300

*Calculated. †85 per cent quality.



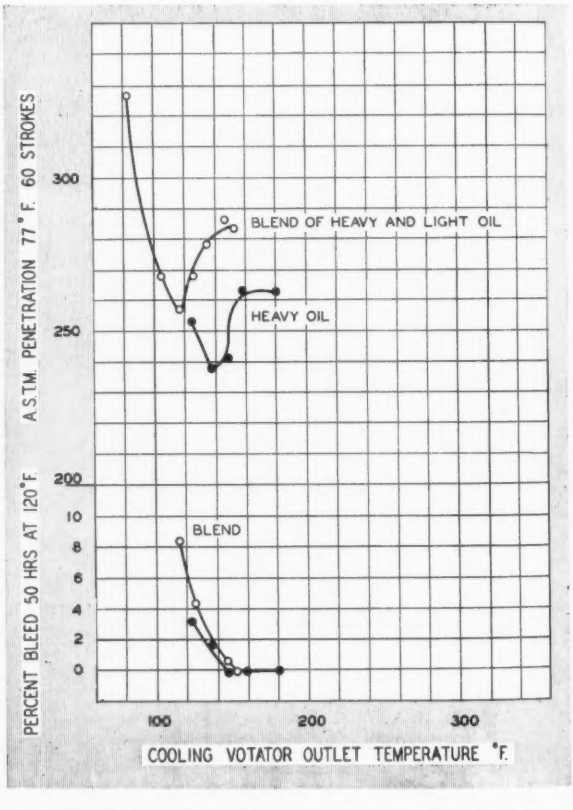


Fig. 6—(Left) Typical cooling curve showing A.S.T.M. penetration and oven bleeds as function of Votator cooling temperature, for grease made from 94 per cent Mid-Continent oil and 6 per cent aluminum stearate soap. Fig. 7—(Right) Cooling curves showing effect of blending low-viscosity paraffinic oil with high-viscosity Coastal bright-stock oil. Blending resulted in lower yield, lower critical temperature, increased sensitivity to syneresis

tions and shows an over-all coefficient of 190 for heating and 160 for cooling.

Gelling.—The grease then flows to insulated gelling tanks (Fig. 5), where it is allowed to gel isothermally so that all the grease has a uniform consistency in the gel tank. Two or more gel tanks are provided. The cooling step and the gelling step are thus separated to allow accurate control of each individual operation. After the gel sets, the grease is pumped through a worker and into package.

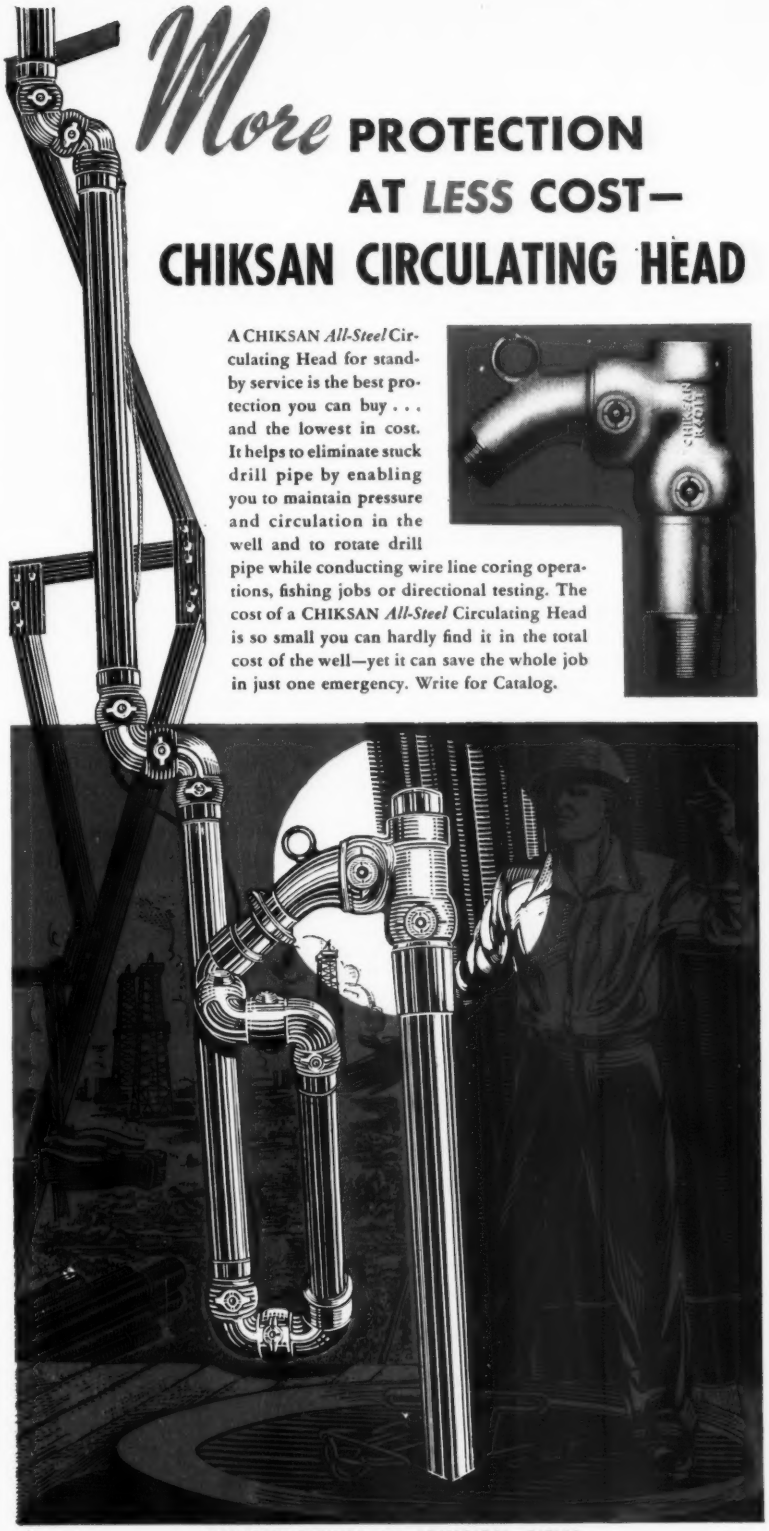
Operation

Scrap grease is held to a negligible amount. When starting the equipment, the grease is pumped through the heater and cooler and back to the feed pump. When equilibrium conditions are reached and operating temperatures correct, the grease is allowed to go to the gel tank. If some scrap grease is formed it is pumped from a small hopper to the feed pump or to the slurry tank and thus reprocessed.

Processing variables.—It was found that the source and refinery treatment of the oil, and the type and manufacture of soap markedly affected operating conditions, and finished product. However, these conditions were constant for a given oil and soap.

Table 2 summarizes pertinent data relating to the following graphs. Fig. 6 shows a typical cooling curve. To obtain these curves thermos-bottle samples of grease were taken from the cooling Votator at various temperatures indicated on the graph. These samples are allowed to cool to room temperature and penetration and bleed values obtained according to standard methods. For more accurate work the samples must be allowed to gel isothermally in ovens and then cooled for penetration tests.

The penetration curves of Fig. 6 show that grease, of this particular formula, has about the same final consistency as long as the cooling temperature is 180° F. or above. This temperature is the transition temperature, which may be defined as that temperature above which this grease will not gel when stored isothermally. As the temperature of this grease leaving the cooling Votator is lowered below 180° F., the finished gel rapidly increases in strength and thus provides better yields. This occurs down to approximately 140° F., which is the critical temperature. At this temperature good stability with maximum yield is obtained. Temperatures greater than the critical temperature produce softer greases which show no oven bleed; temperatures lower than this produce softer greases which show appreciable oven bleeds. From this it was determined that in order to produce the hardest grease one should work as closely to the critical temperature as possible; that to insure a bleed free grease it was well to oper-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ate slightly above it, and that the gelling operation should be separated from the cooling operation. In carrying out the process in this manner, soap savings over batch coolings have amounted to approximately 20 per cent. Moreover, the finished packaged product breaks down little in the A.S.T.M. grease worker; i.e., usually less than 30 penetration points when worked with 60 strokes.

Though these cooling curves do not apply to pan cooling, they do help to better understand some of the problems of batch manufacture. In order to avoid gelling part of the batch-made grease at too low an average gelling temperature and thus produce an unstable product, the main temperature of the grease in the kettle, if similar to grease of the type shown in Fig. 6, would need to be approximately 200° F. or more; and, in addition, the rate of cooling would need to be slow and controlled. In pan cooling, where cooling and gelling take place simultaneously, various hardnesses of grease will be formed in the pan. The grease on the outside will cool quickly and gel to a hard consistency. This grease corresponds roughly to that shown in the lower part of the 140°-180° F. range. Its hardness will, therefore, be proportional to the average temperature of gelling during the cooling period. At the center of the pan just the opposite effect takes place.

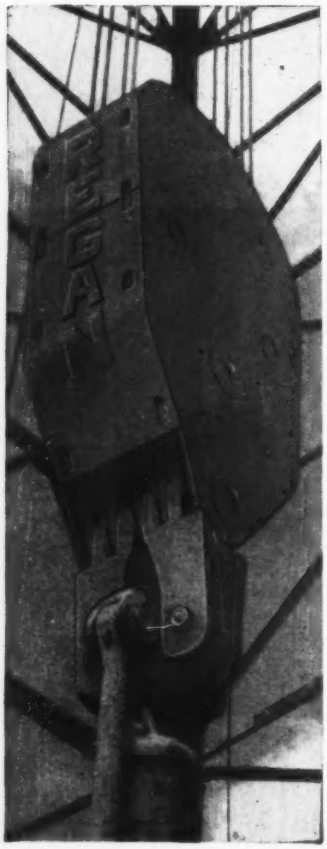
Surrounded by an insulating film of grease the center part of the grease in the pan is slow to gel; it has an average gel temperature high in the 140°-180° F. range, and consequently forms a soft stable gel exhibiting no syneresis. Ofttimes in pans where cooling becomes sufficiently fast that the grease will have an average gelling temperature below 140° F., syneresis results. The grease will then show a high oven bleed or may actually show free oil on the surface of the grease. Pans of such grease may in addition show large fractures and cracks in which the free or extruded oil gathers. The pan method thus leads to a finished product which is blended from all ranges of consistencies and stabilities that this particular grease system can give. This is, of course, brought about by simultaneously gelling and cooling.

Achieving Uniform Product

From the above discussion it is obvious that simultaneous cooling and gelling leads to a product difficult to control and of varying properties. Therefore, if these two functions, cooling and gelling, could be separated a most uniform and hard grease could be produced. Because of the narrow width at the upper part of the vortex in the curves for critical temperature, it is exceptionally easy to mask and pass by the existing aluminum while cooling. And commercially, when the aluminum grease was made in pans, the mixtures of various hardnesses were so complete that such a minimum was not found. In the Votator, on the other hand, a high film coefficient was obtained on the grease side which resulted in a smaller temperature gradient through the grease film. In turn this caused the average temperature of the grease film and the main body of the grease to come quite close together. This, therefore, resulted in a very uniform and controlled product. Furthermore, it allowed cooling to take place without gelling since even with this equipment the gel time was appreciably longer than the cooling period of about 2 minutes. Below the critical temperature, grease will start to gel in the Votator; that is, the soap fibers will have started to grow. These fibers in turn, are then broken by the agitation and an unstable product, as measured by bleed results.

The other tests on proper gelling conditions are generally visual in character and involve an experience factor. These consist of (a) surface sheen, (b) brightness, (c) transparency, and (d) float. The first three of these are self explanatory. Float, however, is defined as the rough ap-

REGAN



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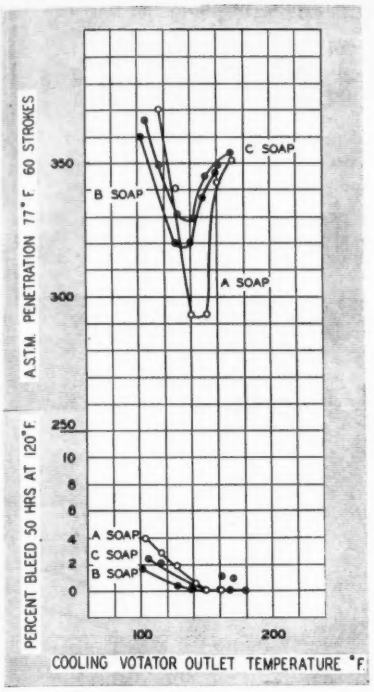
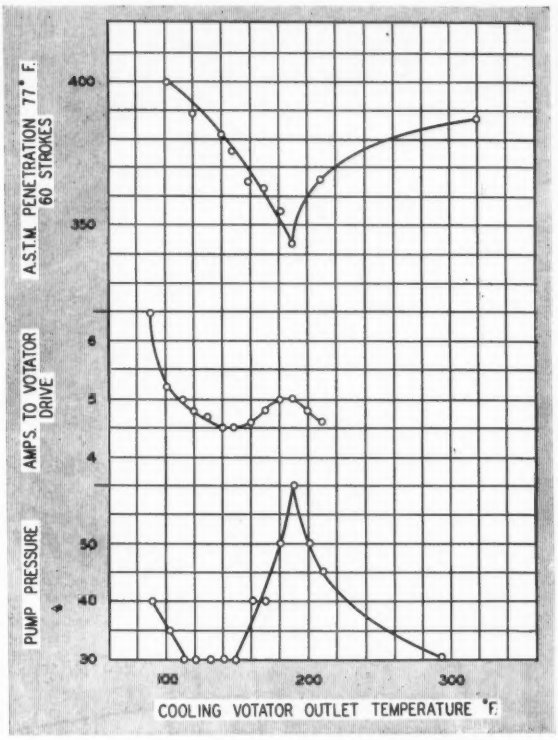


Fig. 8—Cooling curve comparing three commercial aluminum stearate soaps

pearance of a thin spread film of grease when it is examined in reflected light. Float cannot be felt and apparently has little to do with the serviceability of the grease, but has much to do with the sales appeal of the product. Improper gelling is the main cause of float and probably results in different grease structures of different hardnesses which are then worked together but not completely incorporated in the main body of the grease. Impurities in the original

Fig. 9 — Curves showing power load, pressure drop, and cooling curve methods of establishing critical temperatures



soap may also contribute to float. By careful control of gelling, float is avoided and a bright, transparent grease results.

Fig. 7 shows the effect of blending a heavy oil with a light oil with relation to the transition and critical temperatures of these two oils. The addition of light oil lowers the critical temperature, and yield; and increases the tendency of the grease to bleed.

Fig. 8 shows the properties of grease made from three commercial aluminum stearate soaps. Soap A formed a substantially harder grease than either Soap B or C. At the same time Soap C which gave the poorest yield also was somewhat more prone to bleed. Table 1 shows that the molecular weight of the fat in the soap was the major variable in the analyses of these soaps.

Fig. 9 shows the correspondence of pumping pressure and Votator power loads in relation to critical temperature. All three of these methods, cooling curves, power loads, and pressure drop, can be used for the determination of the critical temperature for a given formation.

The advantages of the continuous process reside not only in closer control, but also in higher grease yield, conservation of floor space, and labor savings. In one plant, soap saving alone amortized the processing equipment in 1 year.

TABLE 2—OIL, SOAP, AND GREASE DATA FOR COOLING CURVES

	Fig. 6		Fig. 7	Fig. 8		
Formula:		Oil heavy	Oil blend	Soap A	Soap B	Soap C
Per cent oil	94	92	92	94	94	94
Per cent soap	6	8	8	6	6	6
Oil analysis:						
Source	Mid-Cont.	Coastal	Coastal&Paraf.		Mid-Cont.	
Refinery treatment	Cyl. stock	Br. St.	Br. St. Dist.		Cyl. stock	
S.S.U. viscosity	126 at 210° F.	3940 at 100° F.	545 at 100° F.		126 at 210° F.	
Viscosity index	63	55.5	70		63	
A.P.I. gravity	23.7	21.2	23.6		23.7	
Avg. molecular wt.	550	517	417		550	
Soap analysis:						
Moisture, %	0.6	....	1.0	0.4	0.98	0.6
Total fatty acid, %	89.2	....	93.9	91.6	89.4	89.2
Free fatty acid, %	8.2	....	5.2	7.4	7.6	8.2
Ignition residue, %	9.4	....	9.7	9.8	11.6	9.4
Water soluble res. %	0.8	....	1.0	0.8	1.3	0.8
Water insol. res. %	8.6	....	8.8	8.9	10.3	8.6
Titer °C.	52	....	52	47.4	51.2	52.0
Iodine value	5	....	5	6.0	3.5	5.0
Saponification value	192	....	190	214.0	199	192
Grease data:						
Trans. temp.,* °F.	175	160	160	170	170	170
Crit. temp.,* °F.	140	140	115	145	140	135
Penetration min.†	315	238	258	292	318	328

*Approximate. †60 strokes.

Army Dredge to Be Used On Venezuelan Channel

WASHINGTON. — On a request supported by the Venezuelan Government and approved by the U. S. State Department, the U. S. Army Engineers' seagoing dredge, Haines, will go to Venezuela to assist in keeping open the channel entrance of Lake Maracaibo for maritime traffic, the War Department announced last week.

A large part of Venezuela oil is taken out of Lake Maracaibo. The entrance into Lake Maracaibo is a shifting channel and a bar is forming there which requires dredging by a seagoing hopper dredge to maintain traffic. The only dredges of this type in the western hemisphere are those owned by the Corps of Engineers. The Haines, which saw service in the Pacific during the war, has been chartered for 2 or 3 months by a group of oil companies which will bear the chartering fees fixed by the War Department and other expenses connected with the services of the craft.

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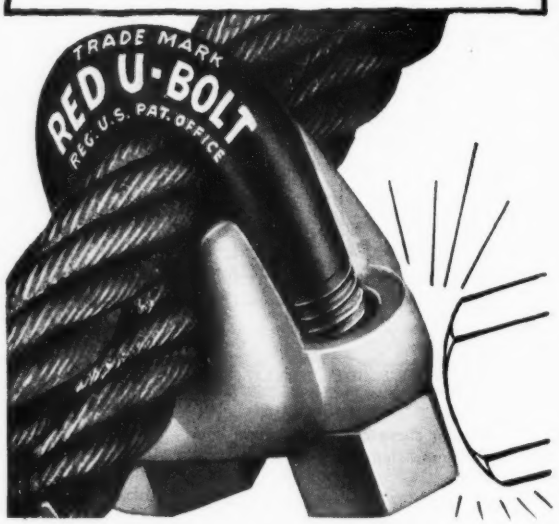

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DIGESTS

NATIONAL LUBRICATING GREASE INSTITUTE

HERE are condensed abstracts of important papers on lubricating grease manufacture and applications, given at the fourteenth annual meeting of the National Lubricating Grease Institute in Chicago, September 30-October 2, 1946. Included are reports of new developments such as strontium and lithium soap greases, and methods for testing trends in application of solid and semisolid lubricants.

Strontium Greases

H. J. WORTH and L. W. McCLENNAN, Union Oil Co. of California, Oleum.

STRONTIUM hydrate, crystalline $Sr(OH)_2 \cdot 8H_2O$, was used in the experimental work of studying strontium soap greases. Equipment was of the conventional steam-jacketed type, built to operate at temperatures up to 500° F. Soap stocks of prime tallow, lard oil, sperm oil, peanut oil, and others have been used. Oils ranging in viscosity from 55 S.U.V. at 100° F. to 200 at 210° F. have been employed with good results. Addition of small amounts of water may tend to smooth the texture of the finished grease.

Strontium greases are of either the buttery or fibrous types, the latter being much like the short and long fiber soda and barium greases. Complex strontium greases are made normally as an anhydrous product and can be heated and cooled repeatedly without any essential change in texture or structure. They are water-resistant, similar to other alkaline earth greases; they are oxidation resistant and have a relatively superior resistance to rust attack on metals covered by the grease. Strontium greases can be used as general-purpose greases, but are used for special purposes mostly, such as in high-temperature work; in one case the only grease that would serve tapered roller bearings under 2,000-lb. load at 400° F. was strontium grease. Motor-generator bearings on trains are also a good application for these greases; other uses are at high-temperature points in aircraft, in antifriction bearings, in kiln bearings in place of brick grease, and on aircraft for overseas service to protect against salt spray and the leaching action of water and naphtha.

Effect of Soap Structures On Apparent Viscosities of Lubricating Greases

T. G. ROEHNER and R. C. ROBINSON, Socony-Vacuum Laboratories, New York City.

FOUR types of greases have been studied, each soap being used in at least two oils. Soaps are lithium, aluminum, calcium, and sodium. Lithium greases show more regular curves of viscosity than do aluminum soaps, especially at lower temperatures; aluminum soaps are sensitive to small temperature changes. Apparent viscosities of calcium base greases respond directly to soap content variations. Low-soap-concentration sodium grease is nearly indifferent to oil viscosity as temperature approaches 210° F. Increase in viscosity with increase in soap content is most pronounced in aluminum greases, least pronounced in sodium greases. Severe milling of calcium-base greases makes for a viscosity reduction due apparently to some breakdown in structure of the grease. From the tests reported, it appears that normal increases in soap concentration in greases do not necessarily lead to increases in apparent viscosities; under certain shear rate and temperature conditions the mineral-oil component may be the predominant factor.

Evaluation of High-Temperature Greases

R. C. ADAMS and S. M. COLLEGEMAN, U. S. Naval Engineering Experiment Station, Annapolis.

GREASE-composition specifications have long since been proved unsatisfactory and other methods for evaluation must be devised. The new Navy High Temperature Grease Apparatus, Specification ANG5A, turns a lubricated No. 204 test bearing at 10,000 r.p.m. at a predetermined temperature; greases are tested at 275° to 325° F., for example, in a manner simulating service-life conditions. Tests show that the simulated service life of greases is halved for each 25° F. increase in temperature. Testing at 300° F. was determined upon, finally. A multiple-bearing machine nicknamed the "Centipede" was developed; six rotating shafts in separate ovens each carrying a No. 212 bearing on which a 150-lb. load is placed, with the shaft rotating at 1,800 r.p.m. Tests show that good greases will lubricate electric-motor bearings at 210° F. for 4,000 hours. Centipede tests are time consuming, requiring about 8 months. Need is for a speedier test and 30 Universal machines have been designed and installed under one operator, which setup can make 600 test hours per day. There still appears to be no royal road to a quick-evaluation method for testing greases for service performance.

Rapid Method for Determining Oil in Lubricating Greases

C. J. BONER and G. A. WILLIAMS, Battenfeld Grease & Oil Corp., Kansas City.

FOLLOWING up the report prepared in 1938 on this test method, considerable variation is still found in the ease of breaking down grease to release the oil therein; calcium greases are easiest, aluminum greases are hardest to break down, generally. To release the oil, greases must be heated quickly, must not overheat light low-flash oils, excess alkali must not be used. Dry lime may be added and mixed with the grease while heating till the water is gone, then cooled in cold water. Small amounts of glycerin aid in breaking greases with soaps made of fatty acids. Sodium soap is usually leached out with water. To speed up work, small amounts of caprylic acid are added to the grease; heat to 250° F. and add lime or barium hydroxide, stir, and filter through cloth. Barium greases are handled similarly; Lithium greases need a little glycerin also to aid separation. This method gives results comparable to those obtained with A.S.T.M. Method D128-37 and the oil may be obtained within ½ hour.

Application of Lubricating Greases

CHARLES I. KRAUS, Alemite Division, Stewart-Warner Corp., Chicago.

KEEPING lubricating greases free from contamination is a matter of the greatest importance to the lubrication engineer. Old grease-pump hand-loading methods are supplanted by special volume-measuring and loading pump fillers. Another method is by supplying lubricant directly to the unit to be lubricated by attaching the original container to a pipe-line which leads to the bearings. A color code for different lubricant containers was developed during the war to prevent mistakes in application of lubricants. The containers are colored for each lubricant. A suggested plan also is to color the application points, valves, nozzles, etc., to show which lubricant is to be applied at each point, by color. Centralized lubrication is well established on many types of machines, reduces down time, and insures proper service. This system includes the single-line terminating system, multiple-line system, single-line circuit, dual-line terminating system. These systems are being installed on old machines as well as in machines as they are manufactured. Special portable lubricating departments are made available now to improve lubricating services and speed up the work.

All-Purpose Gear Oils

H. R. WOLF, General Motors Research Division, Detroit.

EXTENDED studies and test work on various types of gear lubricants for hypoid and similar services have shown that great strides have been made from the earlier lead soap-active sulfur gear lubricants. It has been proved that lubricants which meet Specification 2-105B are superior to other types such as those made to meet the requirements of VV-L-761 specifications. These 2-105B types of lubricants will probably become standard products for these purposes.

Design of Antifriction Bearing Installations

W. T. SAVELAND, Allis-Chalmers Manufacturing Co., Norwood, Ohio.

CARE must be observed in designing antifriction bearings to prevent overgreasing. Proper bearing design insures that the new incoming grease forces the old grease away from the bearing. Bearings are not generally flushed without dismantling the bearing. A grease-removal arrangement is very desirable to build into the bearing housing or support. Bearings may be safeguarded against overgreasing by using one or two integral shields or by a separate baffle between grease receiving compartment and the bearing cavity proper. Simple but adequate instructions regarding lubrication practices to be followed must accompany each unit, such as an electric motor, when it leaves the factory.

PRODUCTION REPORT—Salt Creek Pool

—How a New Small California Field Starts Out

by H. Stanley Norman

This field, discovered through intensive reexamination of available geologic data, is small but relatively "rich." Covering only 100-odd acres, flowing production of 1,700 bbl. per day (restricted) has easily been built up. Depth: 2,800 ft.; indicated recovery: 320,000 bbl. per well.

TYPICAL of the successes resulting in California from painstaking reexamination of geological data is the Salt Creek pool in Kern County, 1½ miles northwest of the more widely known and larger Cymric field. The Salt Creek pool, covering parts of Sections 17, 18 and 20-29s-21e, is quite limited in area. Nevertheless, it may be representative of future reservoirs where many smaller ones will add up to one sizable reserve figure for an area.

The pool was discovered last March by Independent Exploration Co. of California, a comparatively new producing concern which has specialized in ferreting out profitable reserves by "fine combing" geological data accumulated during the years. A cluster of failures drilled several years ago south of the currently proven limits of the Salt Creek pool was extremely helpful in supplying subsurface data for mapping the productive structure.

The Salt Creek structure is a plunging nose complicated by faulting but there is a possibility that subsequent development will revise the current picture, converting it to a symmetrical anticlinal nose.

Definitely Proven Acreage

Definitely proven acreage in the pool totals about 100 acres. The established spacing pattern of nine wells to 40 acres, an average of one well per 4.44 acres, was adopted on a basis of acre-feet of sand. On the basis of development wells so far completed, there is an average of 800 acre ft. of oil sand per well. Crude-oil recovery is estimated at 400 bbl. per acre foot, or 320,000 bbl. per well. The calculations are based on recovery of 25 per cent of the oil in place.

If an efficient water drive is present, as seems probable on the basis of comparison with other fields in the vicinity, recovery may substantially exceed 25 per cent of the oil in place and thus the yield per well may be increased 50 to 100 per cent, depending on the reservoir communication, and final determination of the fault complexity.

The discovery well, Independent Exploration Co. 2 Temblor, 1,120 ft. south and 200 ft. east of the west quarter corner, Section 17-29s-21e, was completed March 13, 1946, for initial production of 430 bbl. daily of 18° A.P.I. gravity oil on small choke. Top of the Carneros sand (Miocene) was picked up at 2,790 ft. and the hole was carried to 2,828 ft. Completion pressures were 275 psi. on tubing and 250 psi. on casing. The well is currently producing 153 bbl. daily through 11/64-in. choke with a gas-oil ratio of 150 cu. ft. and pressures are 220 lb. on tubing and 1,060 lb. on casing.

One of the thickest sand sections so far registered in the Salt Creek field was found in Independent 5 Temblor. Sand was topped at 2,814 ft. and continued to 3,002 ft., a net of 188 ft. The hole was carried to 3,025 ft. in Santos shale. As was expected from the thick sand section, 5 Temblor produced at the initial rate of 631 bbl. of 18° A.P.I. gravity crude through 20/64-in. choke with gas-oil ratio of 125 cu. ft. and pressures of 225 lb. on tubing and 250 on casing.

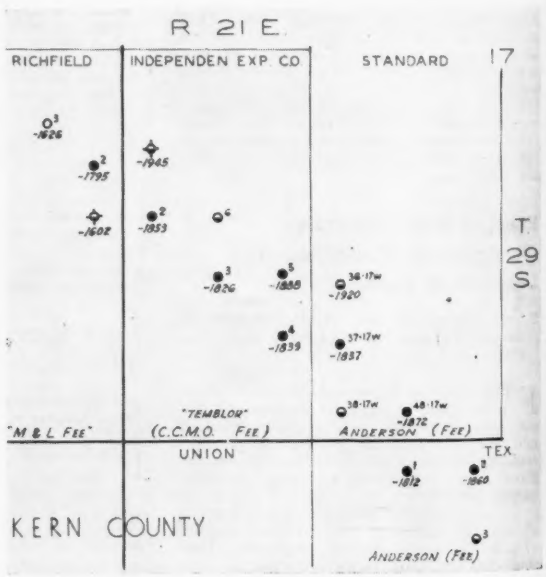
In completing 5 Temblor, Independent Exploration set 7-in. through the entire oil-sand section and gun perforated opposite the most permeable portions. Gun perforations were spotted at 2,814-45 ft.; 2,865-95; 2,915-60, and 2,975-90 ft. This practice was adopted in order to provide adequate

TYPICAL CORE ANALYSIS FROM A SALT CREEK FIELD OPERATION

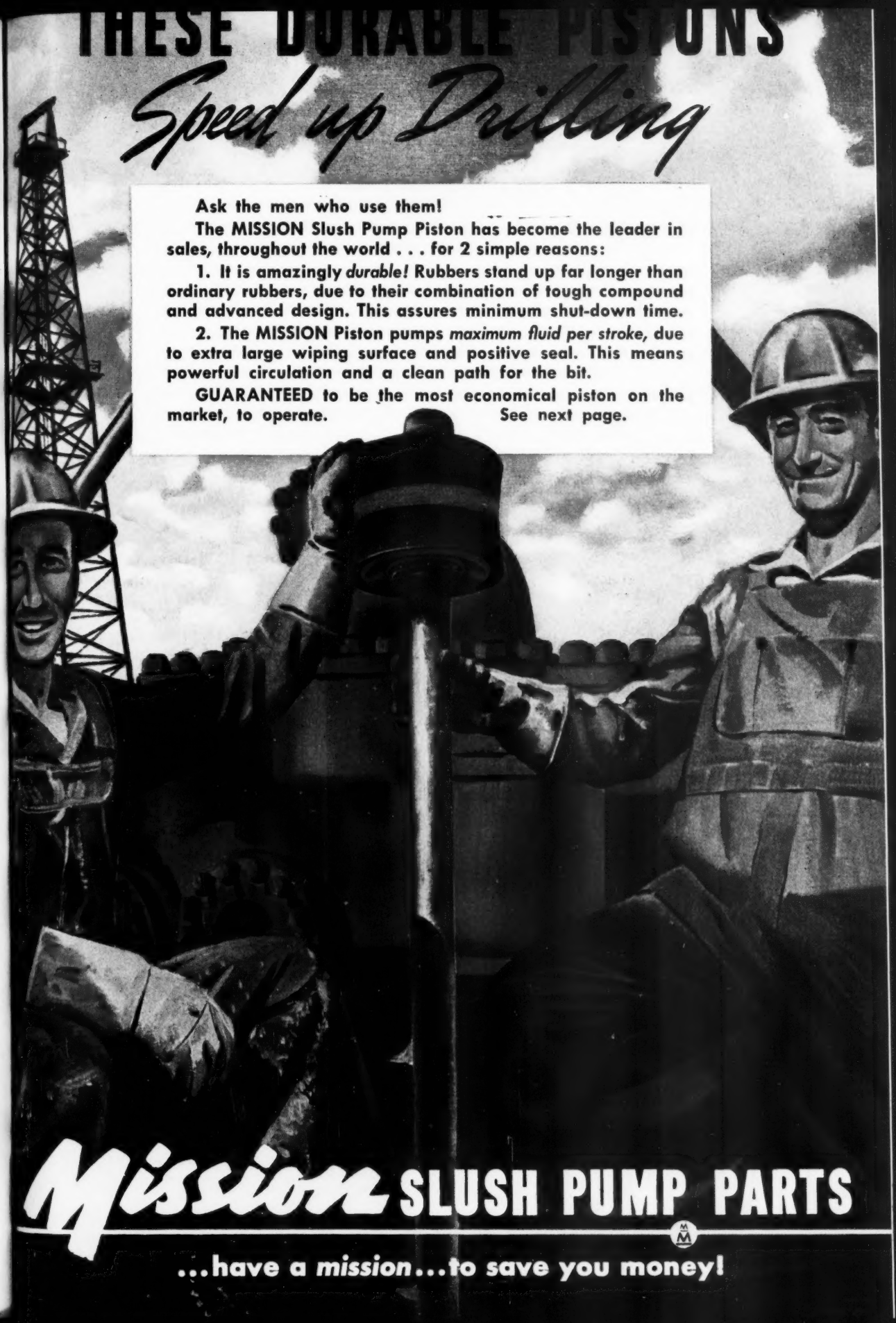
Laboratory No. 19796.
Core samples, sealed, of 3 Temblor.
Submitted by Independent Exploration Co., Bakersfield, Calif.
Type of sand: Medium to fine grained, firm oil sand, very friable.

Cc. oil per 100 cc. sand	18.1
Oil saturation, per cent	51.4
Cc. water per 100 cc. sand	8.7
Water saturation, per cent	24.6
Oil-water ratio	2.089
Gravity of extracted oil, °A.P.I.	15-18
Recommended perforations, mesh	130
Salt content, grains per gallon	525
Effective porosity, per cent	35.22
Permeability in millidarcys:	
Parallel to bedding plane	1,004
Perpendicular to bedding plane	991

Remarks: Classified as "commercial oil sand."



Salt Creek's structure is a plunging nose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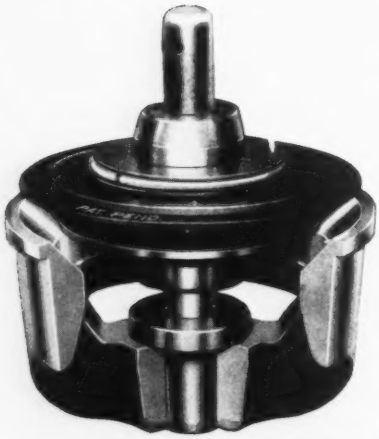


MISSION Slush Pump Valve

MISSION Slush Pump Piston

MISSION Gland Packing

Recognizing that the pumping of mud fluids at high pressures is *very destructive* to pistons, valves and packings . . . the Mission Manufacturing Company undertook from its inception the special study of this problem. Over a period of years, results have been outstanding. Mission has made basic contributions towards prolonging and perfecting the service of slush pump parts, among its important achievements in this field being the following:

1. MISSION "Compound 308" Valve Inserts, which last 3 to 10 times longer than other inserts, depending on the character of the mud.

2. The MISSION File-Hard Valve Body and Replaceable Valve Seat Bushing, in the MISSION Slush Pump Valve . . . which have extended life of the metal valve parts 200 to 500 per cent.

3. MISSION Piston Rubbers, which have practically doubled the period of service, as compared with former rubbers.

4. MISSION Super-Surfaced Piston Rods, which last up to 4 times as long as file-hard rods under corrosive conditions, and twice as long under normal conditions.

5. The MISSION Self-Sealing Gland Packing, which seals perfectly, yet with great reduction of packing and rod wear.

MISSION'S research in the field of slush pump service is *continuous!* With every year, Mission engineers are gaining wider recognition as specialists in this field.

MISSION MANUFACTURING CO. . . . HOUSTON 14, TEXAS

***Export Office:* Room 1636, 30 Rockefeller Plaza, New York 20, N. Y.**

Mission SLUSH PUMP PARTS

. . . for More Efficient Slush Pump Performance

space between gun-perforated intervals for remedial work, as future withdrawals of oil permit water to rise in the reservoir.

One Failure Drilled

One failure in the Carneros was drilled previous to completion of the discovery well. But even this failure contributed to discovery of the prolific small pool. Independent 1 Temblor, 460 ft. north of the discovery, had a thin oil section in the Carneros from —1,943 to —1,950 ft. Here again, utilization of available modern exploratory tools proved advantageous. A dip meter disclosed north dips and Independent Exploration moved 460 ft. south for its 2 Temblor.

All wells are cored through the pay section for selective completion because permeability and porosity vary considerably from one location to another. Permeability in completed wells ranges from 1,000 to 2,500 millidarcys and porosity varies from 30 to 35 per cent. The productive index (barrels production per pound of pressure drawdown) is 3.45. At the current rate of production for the nine completed wells of about 1,700 bbl. daily, the flowing life of the Salt Creek field has many months to run.

Drilling in the Salt Creek field presents no particular problems. Static pressures are about 1,277 lb. at 2,808 ft. Wells are drilled in 12 to 15 days from spudding to completion. Approximately 200 ft. of surface pipe is cemented to top of the hole. Most of the wells have been equipped with 7-in. pipe set at top of the producing sand with perforated 5½-in. liner set through the sand. More recent practice, however, indicates that operators will generally favor setting the 7-in. through the sand section, followed by gun perforating at the pay sections indicating greatest permeability on basis of core analysis and electric logs.

Highest potential production indicated by any completion up to mid-September was at the rate of 1,700 bbl. per day through 32/64-in. choke. Operators are voluntarily restricting wells to a maximum of 200 bbl. daily with the possibility that this rate of withdrawal per well will be reduced slightly as new completions are added.

Components of First Aid Kits

by Henry W. Boggess*

DURING World War II, Americans in general became "first aid" conscious. The American Red Cross sponsored first-aid training classes in practically all communities throughout the country. This widespread training has been of distinct service to all citizens.

Some 20 years ago, the United States Bureau of Mines was engaged in a program designed to train 100 per cent of oil-field workers in a full first-aid course. Since then there has been more or less continuous training in oil fields, with a great deal by company instructors. The effect is not only of value in the proper care and treatment of injured persons before a doctor can take over, it also is beneficial in minimizing and curbing the occurrence of accidental injuries. Any man who learns how to stop arterial bleeding, or to restore normal breathing by artificial respiration, or to apply a complicated splint for a broken back also learns to have respect for the seriousness of such injuries. The result is what may be termed "safety consciousness."

Learning how to administer first aid is one thing and having available at all times the necessary supplies to do the job is another. Most employers in the oil industry see that first-aid supplies are available for immediate use at all points where men work and hazards exist.

In the exploration, drilling, and producing branches of the industry it is impracticable to establish first-aid rooms on leases, at drilling wells and other scattered operations where there is a small number of employes. It is usual procedure to furnish first-aid kits on these isolated operations and to see that the kits are maintained.

There are, of course, various size kits used by different employers but practically all kits have uniform, modern, sterile units and the size of the kit determines the quantity, and to some extent, the kind of units. A standard oil-field first-aid kit in general use is the 24-unit type containing a variation of the following supplies:

One unit.—Two ½-in. by 2½-yd. adhesive-plaster rolls to hold bandages more securely. (Adhesive plaster is seldom used in first-aid work).

One unit.—One 4-in. bandage compress. For first-aid dressing, compresses are preferred to roll-type bandages. Care should be used that fingers do not touch the gauze pad in applying a compress.

One unit.—Two 3-in. bandage compresses to be used the same as the 4-in. compress, only for smaller wounds.

Two units.—Each having two 2-in. bandage compresses and to be used where large compresses are not needed.

Three units.—Each containing 16 1-in. waterproof adhesive compresses. These compresses are ideal for small cuts and lacerations after an application of an antiseptic, such as merthiolate.

One unit.—Two iodine applicator vials. To use, unscrew cap, applying open end of applicator to skin close to wound, tapping bottom of applicator. A wound treated with iodine should not be bandaged.

Two units.—Each containing two merthiolate applicator vials. Use the same as iodine applicators. Wounds treated with merthiolate may be bandaged.

One unit.—Ten ammonia inhalants. These inhalants are in the form of ampoules and are to be used in case of fainting, shock, etc. One of these ampoules should be crushed then passed near the nostrils of the patient.

Two units.—Each containing two 40-in. triangle bandages. Uses of these bandages are multiple and are known to first-aid students or can be learned from U. S. Bureau of Mines, "Manual of First Aid Instructions." Often referred to as "cravat" bandages.

One unit.—One tourniquet and one blunt forceps. Tourniquet to be used to stop arterial or other profuse bleeding. Consult manual mentioned above for details. Forceps never to be used on eyes.

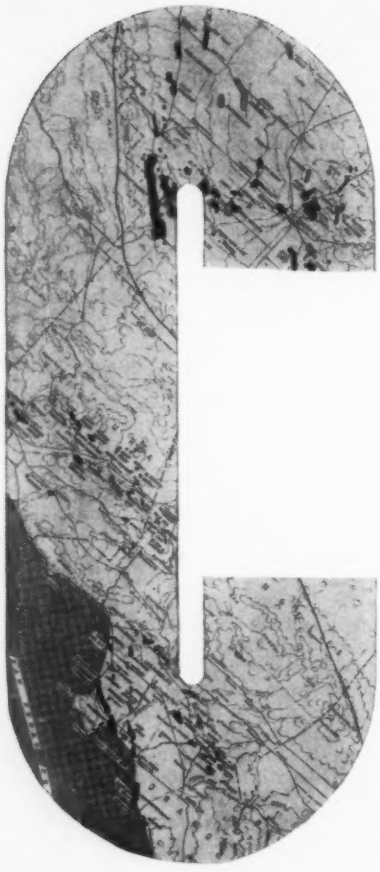
One unit.—One wire splint. This splint to be used in case of a broken bone only when regular splint or board is not available.

One unit.—Four 12 by 18-in. gauze bandage; to be used for general bandaging. Especially useful in dressing burns.

One unit.—Two 36 by 36-in. gauze bandages. Same as above.

One unit.—Two tubes borated petrolatum. One of the several first-aid treatments for burns. Any such ointment should be spread on gauze and then placed on burned surface. Whatever kind of burn treatment is used should be written on a tag which should be put on the patient so the doctor will know what has been used.

*Superintendent of Employment-Insurance-Safety Department, Sinclair Prairie Oil Co.



CALIFORNIA

Drilling Practices

by F. N. Kellogg

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Most common drill-pipe size used is the 4½-in. with some operators prefering the 5⅝-in. for surface hole. For drilling out of the production string 3½-in. drill pipe is used.

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Geological aspects in drilling.—No discussion of drilling practices in California would be feasible without first a brief mention of the stratigraphic conditions confronting the driller. It has been said that the Pacific Coast is a geologist's nightmare what with its complex structures and ever-changing pattern. Production is mainly confined to the Miocene, Oligocene, and Eocene.

While changes in dip in the Mid-Continent may vary from 20 to 100 ft. per mile, in California the dips often reverse themselves in a matter of a few hundred feet. Structures prolific in oil in California have been anticlines and domes, combinations of folding and faulting, and fractured zones. Structures that have yielded oil in large quantities in other areas are noticeably lacking in California, for example, salt intrusions, reservoirs developed in fissures, limestones, dolomites, and igneous and metamorphic rocks.

At one time it was felt that the schist was considered basement in California; however, some of the most recent production has been found in fractured schist formations. Holes in California have been actually lost due to earth movements and blowouts have been attributed to this fact. The greatest need now in California, geologically speaking, is the finding of structures that might produce oil. No major discovery has taken place in this decade.

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The combination of tooth form, whether spiral, radial, concentric, eccentric, short or long, combined with the other factors of drilling are usually contractors' secrets. Each has its own field of usefulness although generally it has been found that the bits with shorter teeth are more adapted to hard formations and the longer teeth to softer strata. In general it has been found that teeth should be so designed as to throw their cuttings outwardly and thus avoid recutting by following teeth. The fluid stress should be directed against the teeth in their forward direction of rotation in order to clean them and at the same time prevent locking of the cutters. This is especially true in soft-formation drilling.

The fluid nozzles should be of a size and capacity that will maintain the maximum fluid velocity with minimum increase of delivered pressure from the pump. Venturi-form nozzles are much to be preferred. It is felt that the bit and its use are often the key to drilling costs. This is apparent when more than 100 rock bits are required to put down a single hole. Every effort is made to acquaint the driller with the purpose of the bit and the actual mechanism it is performing in the hole. Certainly the proper utilization and subsequent improvements in its design will materially reduce drilling costs.

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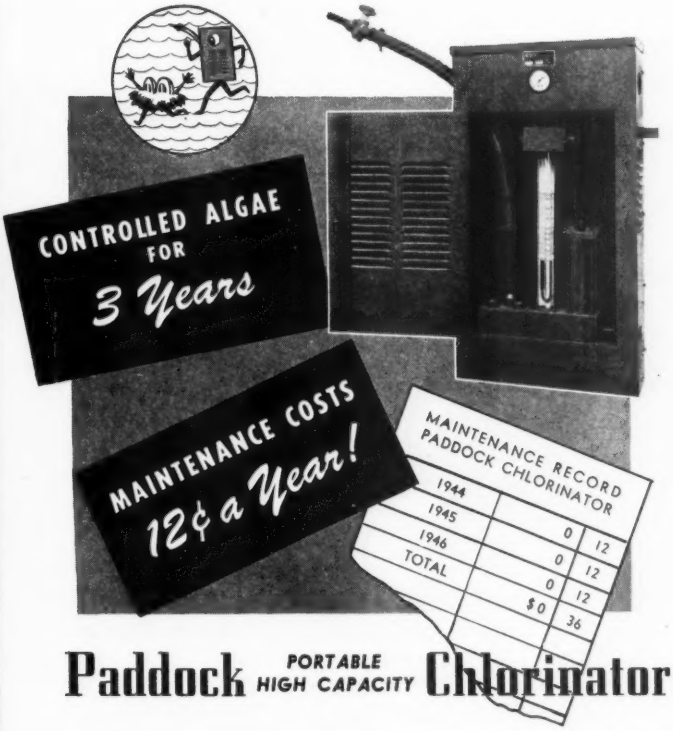

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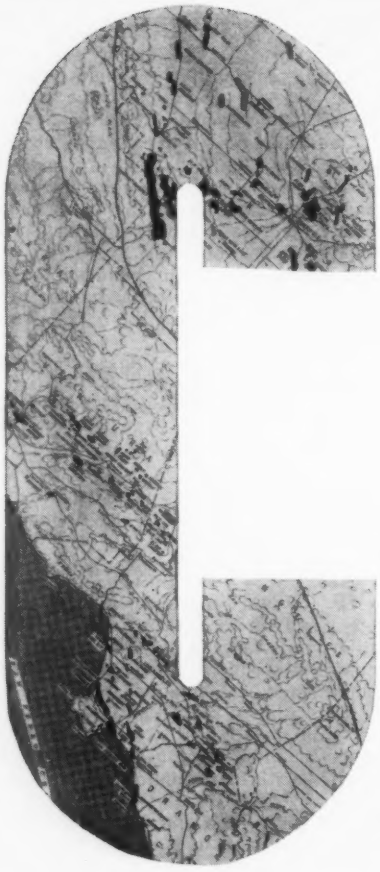

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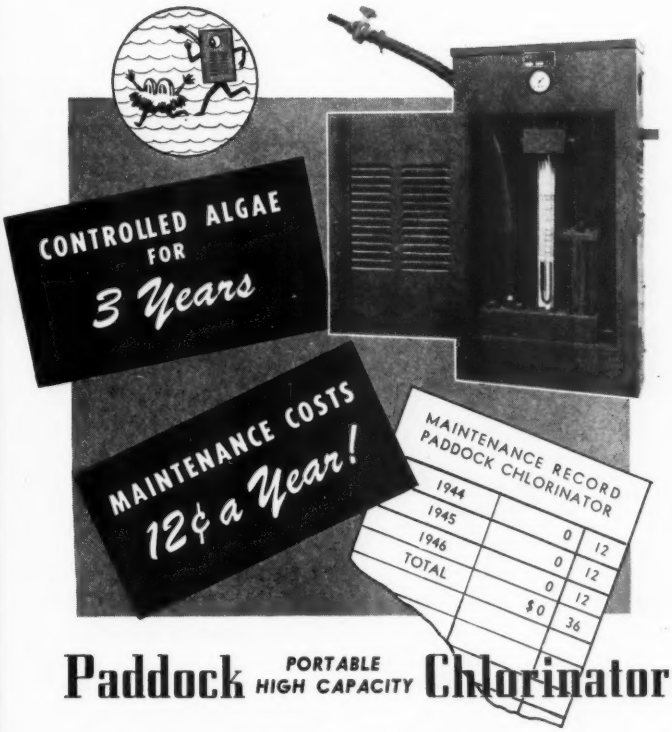

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The trend has been towards cutting off worn-out tool joints and replacing with new. This method has the added advantage of on-the-site application and does away with the transportation charges of taking the pipe to a shop for resleeving. Also not to be discounted is the fact that a string of pipe is not laid up for repair. By laying down pipe as the need of new tool joints becomes apparent and applying new joints at the well site the string can be kept in constant use. An increasing use in the matter of tool joints is the practice of applying oversize ones. These take the brunt of wear and result in longer life both for the drill pipe and tool joints.

At certain deep fields with hard digging, tapered drill strings have been used. This tapered string is either in size, weight, or grade, depending on the contractor. Experience has proved, though, that this is troublesome and tends to cause mistakes. Invariably when a single is added the wrong weight or grade is used with disastrous results. With present-day personnel constant supervision is required. A solution might be the use of different threads on the different sizes, weights, and grades but the added inventory of subs and the added chances of having the incorrect subs more or less discards this practice.

From the standpoint of actual drilling efficiency or hole-making efficiency unquestionably the most important part of the hydraulic system, not excepting the bit, is the drill-collar assembly. As the name implies the first use of the drill collar was only for the purpose of attaching the bit to the lower end of the drill pipe. Later it was more desirable to have more stiffness above the bit, consequently the length of the drill collar was increased.

The trend in California has been to increase the number of drill collars in proportion to the depth of the well. For the medium-depth hole 4 collars are used and on the deeper wells from 8 to 12. The derrick height has been increased so that the breakdown of drill collars in stands will be less. This materially speeds up round trips. Since round trips do not make money for the contractor the advantage of quicker round trips is easily seen. Not to be discounted is the crew-fatigue factor.

The limit in adding drill collars is not known but a common practice is that the weight of the drill collars should be roughly double that carried on the bit, thus when drilling with 6 tons of weight on the bit there should be at least 12 tons of drill collars, or in terms of length about 180 ft. or two stands. Wells below 10,000 ft. in California usually have a very tough shale or chert body immediately above the producing horizon. Penetration is usually measured in inches per hour. A great many fishing jobs at this depth are due to pin failure between drill collars. Using an A.P.I. joint with a 6-in. pin and box has done much to cut down the number of failures.

Weight carried on the bit is the next logical factor. This seems to be one of the most controversial of all subjects in the drilling of a well. Let us consider what we feel to be the advantage of a long string of drill collars. First, sufficient weight is present to supply the bit with the desired pressure on bottom, thus enabling it to maintain its maximum cutting efficiency. Secondly, the weight in excess of that required by the bit keeps the pipe in tension and insures a vertical hole. This is important where the dip is vertical or nearly so. With the drill pipe in tension the universal joint action within the drill pipe when rotating is avoided resulting in fewer fishing jobs and longer life. Thirdly, we feel that with a long string of drill collars and high rotating speeds the momentum of the heavy revolving shaft will cause comparatively constant rotation of the bit. By this action the drill collars eliminate a substantial part of the stall shocks and in general protect the rotating equipment.

Another general thought is that 75 per cent of the weight of the drill collars is carried on the bit. With two stands of 8-in. drill collars this would

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mean a weight of 20,000 lb. on the bit. For dipping beds this might be decreased to 50 per cent which would mean 14,500 lb. on the bit. For hole-straightening purposes this might be decreased to 25 per cent or 8,000 lb.

Weight on bit.—It is difficult to present a logical discussion of the proper weight to carry on the bit without knowing the many factors involved. Generally our yardstick has been that of experimentation. If hole isn't being made more collars are added. So far it has appeared that the more collars the better the digging. Bits are sometimes pulled after a few hours or whenever they seem to stop digging at a rapid rate. Although bits may only be 50 per cent worn out the added hole in less time seems to justify the procedure.

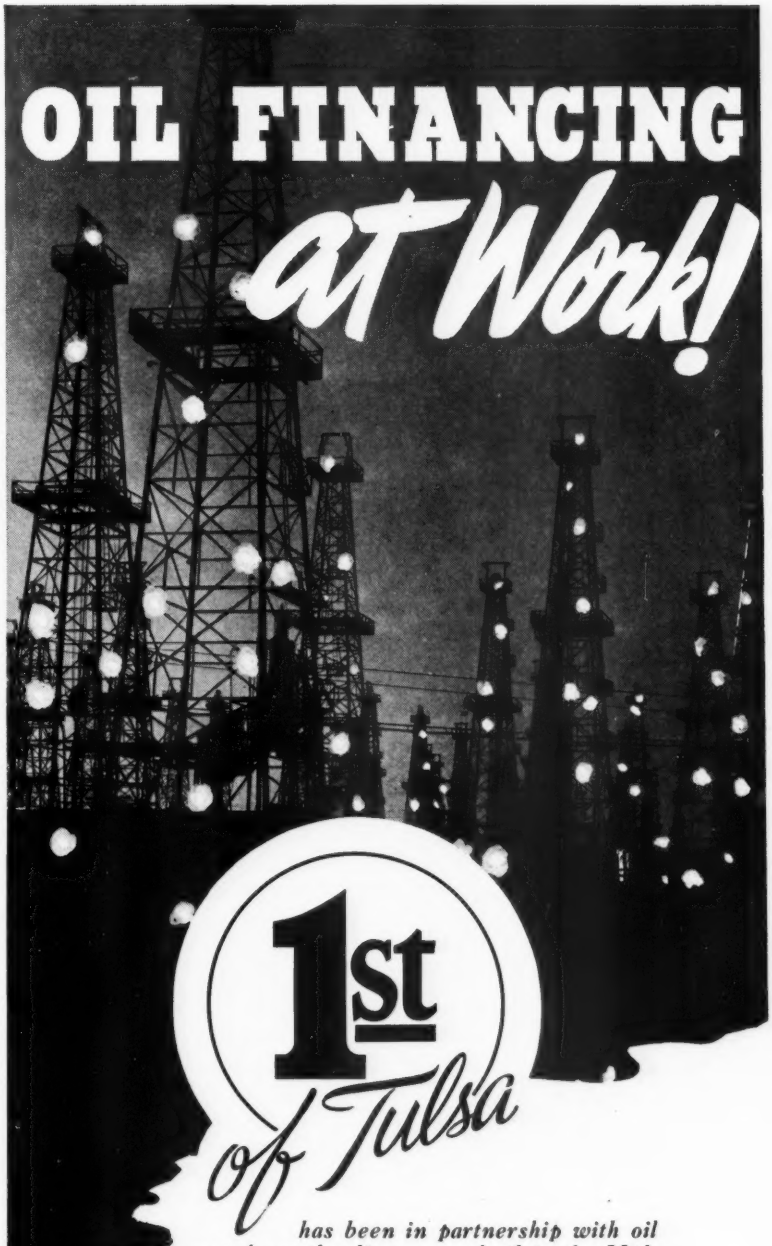
Rotating speed.—This is probably the next most controversial of all factors of rotary drilling. The speed used in California varies from 300 to 350 r.p.m. Some operators rotate at speeds as high as 500 r.p.m. Exponents of high and low r.p.m. both have their reasons, some good and some bad, and both have had success and failure. The bit design and formations being drilled appear to be the keys to the correct range of operating speeds.

In the softer formations of California the rate of penetration seems to increase directly as the speed of rotation. However, in the very hard formations higher speeds induce a bouncing in the drill pipe which when harmonizing with the pump pulsations causes twistoffs. In general we feel that rotating speeds up to 350 r.p.m. are safe and do not cause undue equipment failures. There are other conditions which must apply too, one of which is that the drilling string must carry sufficient drill collars so that the drill pipe is carried in tension. Also the bit must be fed smoothly into the formation to avoid stall shocks.

Drilling fluid or mud.—The mud in average weighs about 70 lb. per cu. ft. and has a Marsh viscosity of 28 to 30 seconds based on 500 cc. in and out of the funnel. The actual condition of the mud varies from field to field. Most muds are those built of natural aluminum silicates containing some organic matter. In starting a well commercial dry bulk mud is mixed at location. Thence hole sometimes makes its own mud, although generally dry commercial mud is continually added. Chemicals and special muds are added to insure it being kept in proper shape.

The derrick man of each crew doubles as a pseudo mud engineer making such tests as density, viscosity, sand content, filtration and wall-building properties, and gel strength at certain prescribed intervals, and entering his findings on the drilling log. Tool pushers are mud minded and

Look Ahead With First National



has been in partnership with oil men from the discovery of oil in the Mid-Continent, providing through oil loans the financing necessary for the extension of oil production from Illinois to the Gulf Coast.

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The illustration below shows a battery of 12 ammonia condensers, part of this plant. All of the structure visible in the photograph has been coated with AMERCOAT. Sea water is used as a coolant and the entire structure is subject to constant salt spray, as well as ammonia and acid fumes.

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are familiar with procedures to be followed. They prescribe what chemicals to add and are held responsible for keeping the mud in proper condition. Only in extreme cases or where the pusher is unable to cope with the situation are mud engineers brought into the picture. Volume and pressure of mud in the system are dependent upon the rate of penetration. The softer the formation and greater the rate of penetration the greater the volume of fluid used, when pumps are run in parallel. The rate of carrying cuttings out of the hole is kept between 3 to 5 ft. per second. Volume and pressure are regulated to meet this condition.

Personnel.—This is the last phase in the discussion of drilling practices and it is touching on delicate grounds. Since the beginning of the war labor has been the outstanding problem of the drilling contractor. In a nutshell there just aren't enough rotary helpers. The Pacific Coast has had and is continuing to have a great industrial expansion.

At one time oil-field employes were the highest paid of any profession. Sadly though this is no longer the case. Almost all industrial fields have come up to the standard of wages paid in the oil industry and in some cases have even surpassed it. The younger potential roughnecks seem to prefer the white-collar type of work and the opportunity of staying in one locality. The housing situation prevents many crews from going to one location to another. Contractors have found out that to bid on a wildcat in some faraway location invites labor trouble. Not only is it a problem to keep a full crew but demands are made for added compensation in the form of transportation and subsistence. In some cases this demand must be met to get the hole down according to contract.

Many operators on the West Coast have great faith in oil-base mud or as it is commonly called, "black magic." Crews demand and get a bonus when this is used. Even with the bonus, turnover of personnel approaches 50 per cent. It is no unusual experience to have a roughneck quit in a middle of a tour when there's a wet job or too many stands to pull out. Ironically a man doing this can easily get another job the following day due to the great demand for labor. Basic wages have been increased according to the national pattern and another increase appears to be in the offing. These factors would appear to justify an increase in the price of footage drilled and day rates. Due to intense competition just the opposite is taking place. Although drilling costs have risen the going price per foot of hole is decreasing. On a graph the lines of drilling costs and profits are meeting and in some cases have met.

The problem confronting many con-

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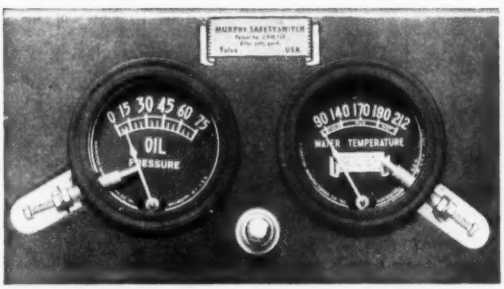

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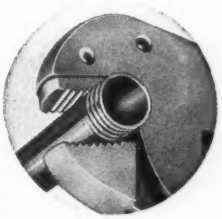

You won't find this feature in any other locking wrench. It's an exclusive advantage of the patented BMC toggle . . . a device that makes the jaws close parallel to each other no matter how wide the jaw opening. It means that the jaws *grip to the very tip* with no play or looseness to round edges, spoil flat surfaces or cause accidents. In fact, you can loosen nuts and studs that you can just reach.

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Fig. 102 (Front)—Acme Wire Line Clamp—12" liners. Only 10 parts—160 lbs. 200-ton breaking load. 6 to 1 safety factor. Perfectly balanced, for 1 man hitch-on, SAFELY. Patented non-fouling SAFETY link. Recommended for 3000' wells.

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FIG. 102

Acme

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The superior service qualities of Acme Drilling Clamps — that make them *first choice* of seasoned drillers everywhere — aren't found alone in their better metals, better heat-treatment and better machining, but also in that intangible *larger something* which 46-years of relentless striving for perfection adds to them . . .

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Fig. 103 (Front) — Acme 18" Safety Wire Line Drilling Clamp. For wells deeper than 3000'. Same exclusive features as 12" clamp — for safe "super-service" — but with 50% more gripping surface. Weighs only 173 lbs. but a GIANT in action.

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tractors is whether to take contracts with a negligible profit and so maintain an organization or whether to rack the tools and wait for a more favorable period. It is felt that some of the contractors are not taking into consideration depreciation, contingencies, or the risks involved. It is apparent with this practice that in the not too-distant future California will have fewer good contractors.

Safety

No discussion of drilling practices would be complete without a brief mention of the safety requirements demanded by the state through the Industrial Accident Commission. At times we feel that the rigid requirements impede the rapid drilling of wells; however, all things taken into consideration undoubtedly greater efficiency is realized. This is particularly true when many of the men are unfamiliar with drilling machinery. Certainly in this case the old adage proves true that an ounce of prevention is worth a pound of cure. Field engineers of the commission make frequent inspections of drilling rigs and their recommendations for the correction of unsafe conditions must be carried out. A given period of time is given to correct these conditions. Usually a follow-up inspection is made by the state safety officer. Various safety orders have been published by the state which give teeth to the safety engineer's recommendations.

From files of California contractors I have noted some safety recommendations. One that has caused annoyance is that generator shafts, fanbelt shafts, or water-pump shafts are not completely covered by guards. It can be pointed out that all shafts regardless of size must be covered by guards. This way not a single moving part is exposed. Often pump guards have been written up because they do not meet the letter of the law.

Probably a decided characteristic of California derricks is the runaround at the fourble board and crown and resting platforms at certain intervals on the ladder. This same law requires an auxiliary means of escape to the ground from the principal working platform. This is provided for by means of a special rigged life line complete with a roller-coaster-type swing. All power pumps must have a relief valve and the valve must be covered with a sturdy metal sleeve. This will prevent the shear pin or nail from coming in contact with employes. The outlet of the relief valve is rigged up so that the mud returns to the mud pit. Butane tanks in a location where impact with a motor vehicle is possible must be provided with suitable curbs, fences, posts, or railings. This must be done so as not to impair free ventilation around the tank.

The Refiner's Notebook

A WEEKLY FEATURE OF THE OIL AND GAS JOURNAL

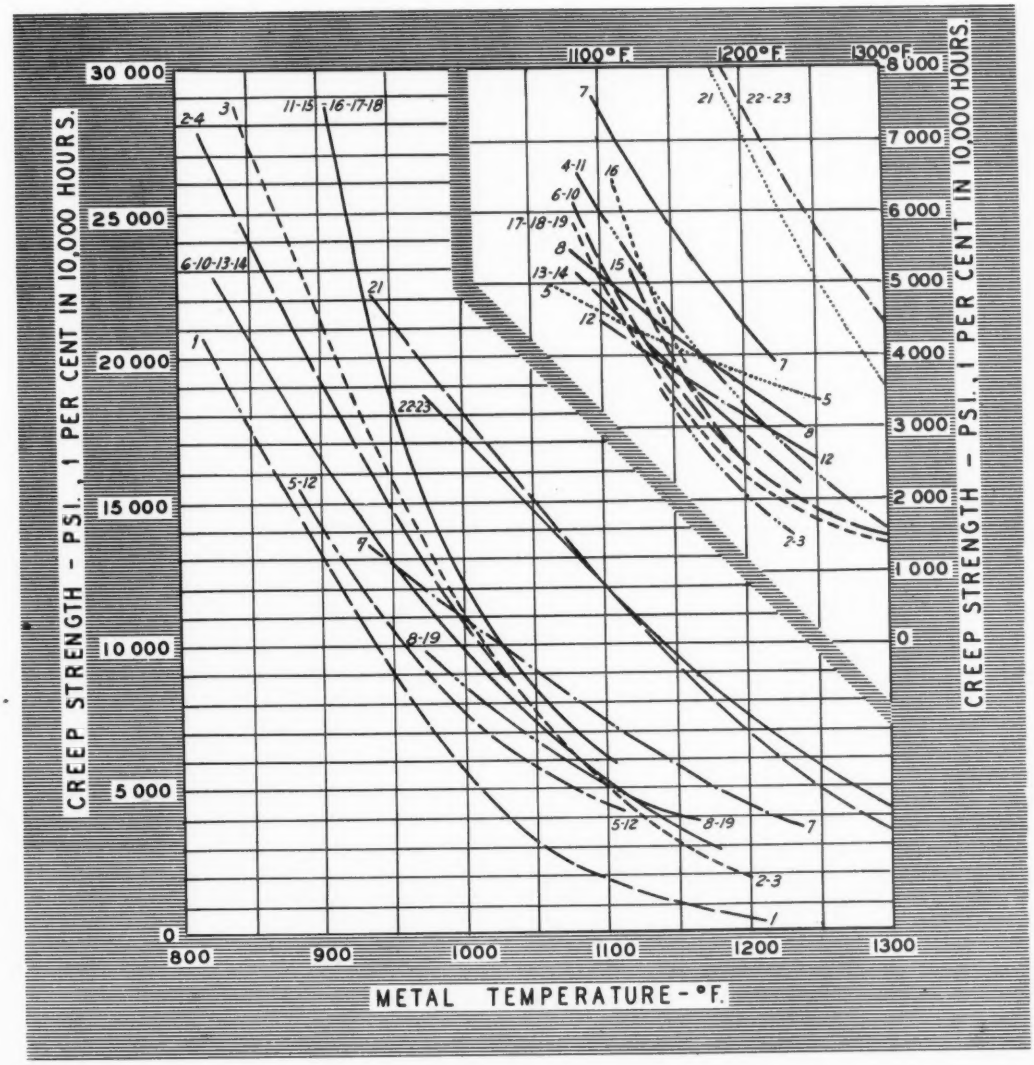
Creep Strength of Steels

1 Per Cent in 10,000 Hours

Curve	% Cr	% Si	% Mo	% Ni	Curve	% Cr	% Si	% Mo	% Ni
1	....	0.25	....	....	11*	5.0	0.5¶	0.5	....
2	....	0.5¶	0.5	....	12**	5.0	0.5¶	0.5	....
3	....	0.25	1.0	....	13	5.0	1.5	0.5	....
4	2.0	0.5¶	0.5	....	14	5.0	0.75	1.0	....
5	2.0	1.2	0.5	....	15	8.0	0.5¶	1.0	....
6	2.2	0.75	0.5	....	16	9.0	0.5¶	1.1	....
7	2.2	0.5¶	1.0	....	17	12.0	0.75¶	0.5†	....
8	3.0	1.2	0.5	....	18	15.0	0.5¶	....	....
10	5.0	0.5¶	0.5	....	19	17.0	0.75¶	....	....

Curve	% Cr	% Si	% Mo	% Ni
21‡	18.0	0.75¶	....	8.0
22	25.0	2.0¶	....	12.0
23	25.0	0.75¶	....	20.0

*Stabilized with titanium. **Also 0.5 per cent aluminum. †Or no molybdenum. ‡Same if stabilized with titanium. ¶Maximum.



No. 115 in a series by W. L. Nelson, professor of petroleum refinery engineering, University of Tulsa

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THE PORPOISE—or as some know it, the bottle-nosed dolphin—carries in its head a blubber, from which, after four years of processing by a secret method, was refined the world's finest and most expensive oil. However, according to government sources, the quality of this oil declined with the death of its inventor.

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The oil costs—take a deep breath—$1,100 a gallon! Considering that ⅓ of a drop is required for the bearings of a 21-jewel watch, the 61,400 drops in a gallon would lubricate 3,868,200 bearings for less than a third of a cent each...and provide every one with the finest protection known to science.

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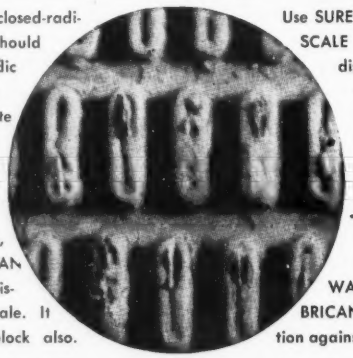

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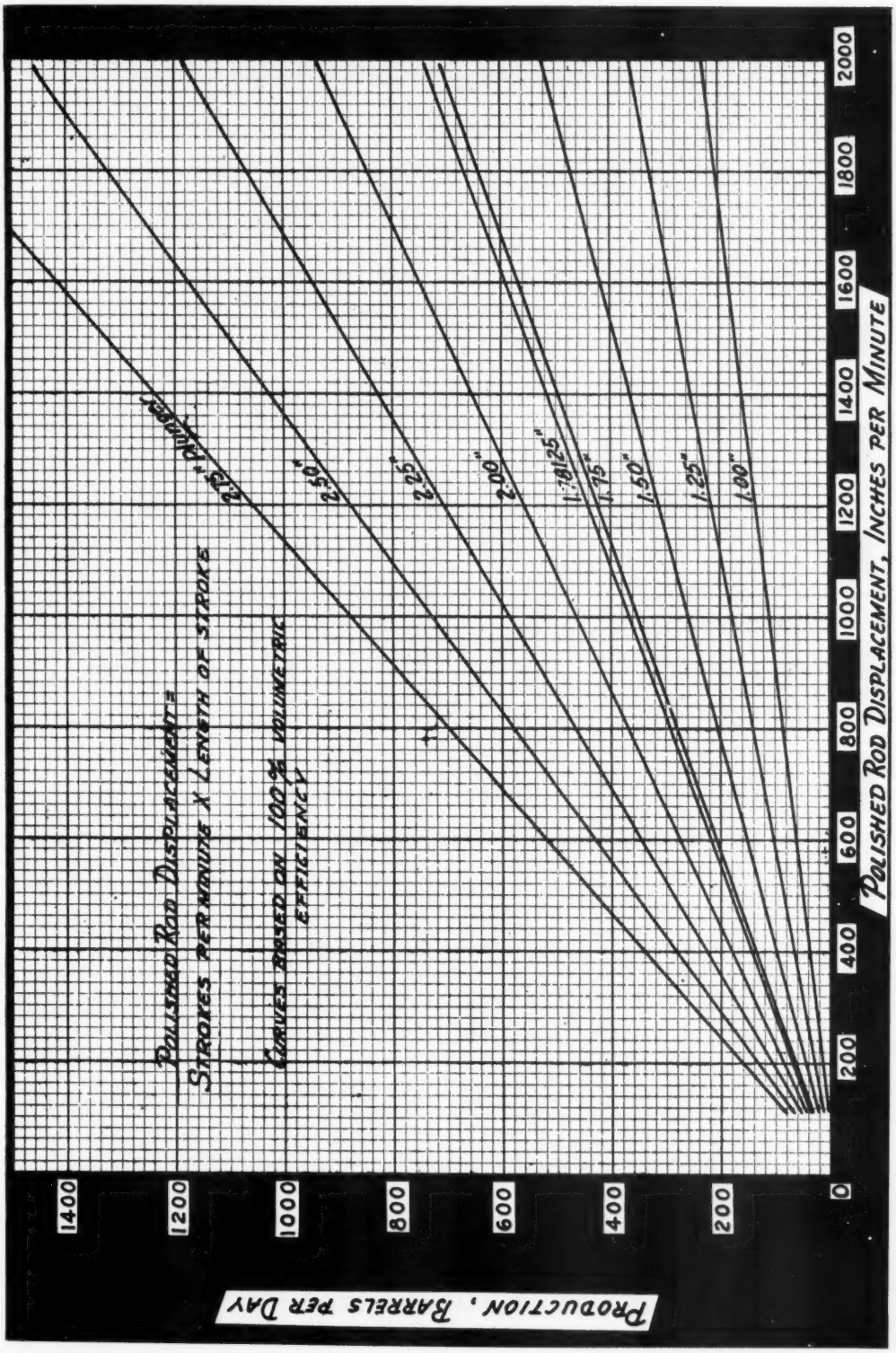


Series prepared by Dr. E. A. Stephenson, head of petroleum engineering school, University of Kansas

QUESTIONS on TECHNOLOGY

by W. L. Nelson
Consulting Engineer

Sulfur Nomenclature

What is meant by 1-sulfhydryl-propane? I don't find such a compound listed in my organic chemistry book. —A.F.C.

The material 1-sulfhydryl-propane is a little-used name for propane 1-thiol or propyl mercaptan.

This question introduces a difficulty that is regularly encountered in the naming of sulfur compounds. This situation has been recently discussed by John S. Ball and Wm. E. Haines of the Laramie, Wyo., Bureau of Mines Experimental Station in their paper entitled, "Nomenclature of the Sulfur Compounds in Petroleum," which was presented (not for publication) before the Atlantic City meeting (April 8-12, 1946) of the American Chemical Society. According to these authors the four main kinds of sulfur compounds found in petroleum should be named as follows (also see Fig. 1):

1. **Thiols.**—This name is applied to hydrocarbons to which an SH group is attached and the term "thiol" is used as a suffix. Such compounds are also widely known as mercaptans (a suffix) and to some extent as sulfhydryls (a prefix) and mercaptos (a prefix). Examples of the "thio" system of naming, as adopted by the International Union of Chemistry, are ethanethiol (ethyl mercaptan); 2 propene-1-thiol (allyl mercaptan or 1-sulfhydryl-2-propene); benezenethiol (phenyl mercaptan or thiophenol); cyclopentanethiol; and 1 cyclohexyl-2-propanethiol.

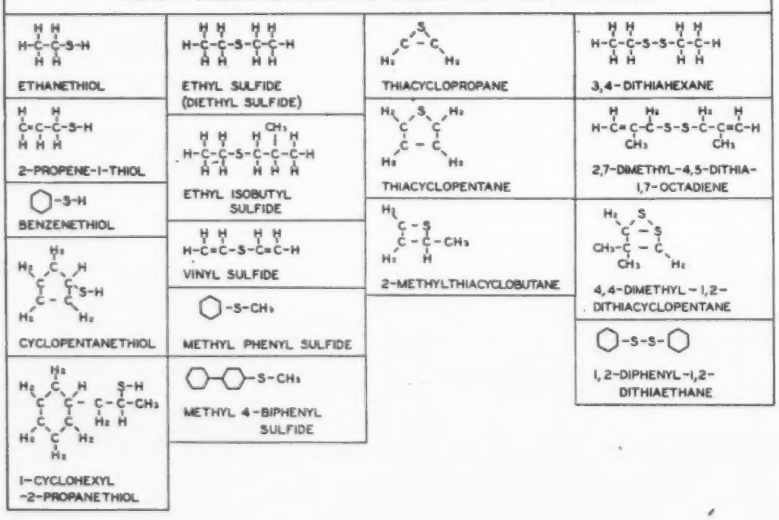
2. **Sulfides (Open chain).**—The suffix "sulfide" is used for open-chain compounds which contain only one sulfur atom. Thus $C_2H_5{\cdot}S{\cdot}C_2H_5$ is ethyl sulfide or diethyl sulfide, and it has sometimes been called ethylthioethane (the International Union System), 3-thiapentane, or ethylmercaptoethane. Other typical compounds named by the "sulfide" system are ethyl isobutyl sulfide, vinyl sulfide (or divinyl sulfide), methyl phenyl sulfide, methyl 4-biphenyl sulfide.

3. **Sulfides (Closed chain).** — The prefix "thia" is used for sulfides in which the sulfur atom occurs in a ring structure. Thus, thiacyclopropane is also known as ethylene sulfide and epithioethane (the International Union System). Other examples of this naming system are thiacyclopentane, and 2-methylthiacyclobutane.

4. **Disulfides.** — Compounds which contain two adjacent sulfur atoms are named by the use of the prefix "dithia." Thus, $C_2H_5{\cdot}S_2{\cdot}C_2H_5$ is 3,4-dithiahexane and may also be known as ethyl disulfide or ethyldithioethane (the International Union System). Other compounds named by this system are 2,7-dimethyl-4,5-dithia-1,7-octadiene (2-methallyl disulfide), 4,4-dimethyl-1,2-dithiacyclopentane (4,4-dimethyl trimethylene disulfide), and 1,2-diphenyl-1,2-dithiaethane (phenyl disulfide or diphenyl disulfide).

The structural formulas of the several compounds mentioned here are shown in Fig. 1.

FIGURE 1—STRUCTURAL FORMULA AND NOMENCLATURE OF SULFUR COMPOUNDS



Safety Fuels

What is a safety fuel made of? Can you use regular crude oil or do you have to add agents to keep it from burning?—F. R. P.

The term "safety fuel" has been used with reference to petroleum fuels of such high boiling range that they are not as inflammable as regular gasolines, being in this respect more nearly like kerosene. Agents are not added to them to suppress inflammability although there may be patents covering such additive agents. Of course, such fuels cannot be used in regular aircraft or automotive engines.

Such fuels have been considered for many years (1926-1930) particularly for aircraft engines, racing-car engines, etc., and recently renewed interest has arisen because the alkylation processes developed during the war produce a small amount of high-boiling material which has a high octane number. The general situation was discussed on page 36 of the June 26, 1946, issue of National Petroleum News and the following tabulation of properties was published by F. R. Staley, on page 136 of the June 15, 1946, issue of The Oil and Gas Journal:

A.P.I. gravity	56.7
A.S.T.M. distillation:	
I.b.p., °F.	300
50 per cent	345
90 per cent	380
F.b.p.	400
Flash (closed cup), °F.	100
Vapor pressure	0.5

These properties are the same as for a Stoddards or cleaners naphtha, except that the safety fuel may have a better detonation quality than that of a naphtha.

Heating Value of Acid Sludge

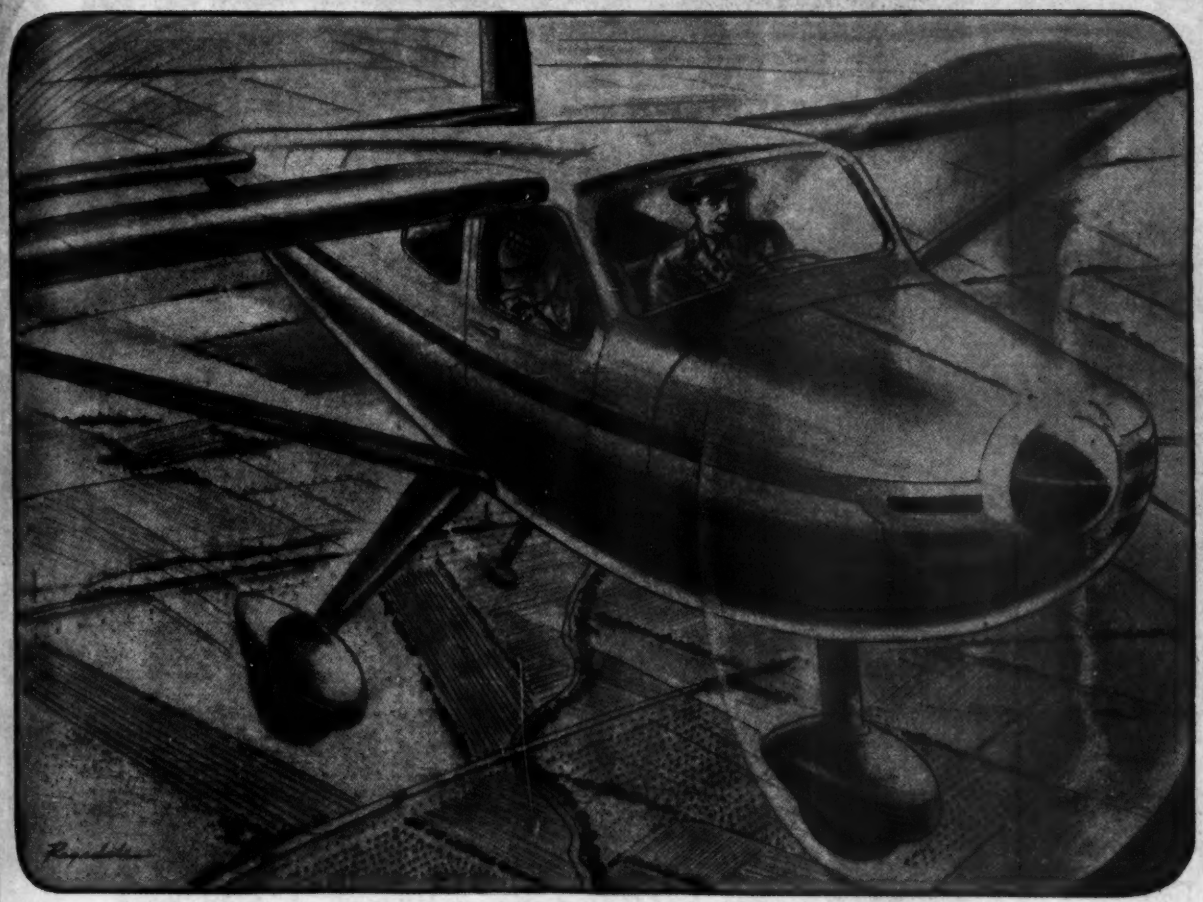
What is the heating value of acid sludge used to fire boilers?—C. O. F.

Acid sludge varies so widely in its properties that exact values cannot be given. Most generally the heating value of dry acid sludge ranges from 12,000 to as high as 19,000 for sludges from treating light oils such as gasoline, naphtha, or kerosene. However, water or weak acid often constitutes a large percentage of the fuel that is fired. The water greatly reduces the "as fired" heating value of the fuel to such values as 7,000-17,000 B.t.u. per pound. The water not only fails to burn, but heat is required to vaporize it. Thus, the net "as fired" heating value of a sludge which contains 40 per cent water might be computed as follows:

Net H.V. of 0.6 lb. oil—
$15{,}000 \times 0.6 = 9{,}000$ B.t.u.
Vaporize 0.4 lb. water—
$1{,}058 \times 0.4 = 425$

Net "as fired" H.V. = 8,575 B.t.u.

WELL-KNOWN SIGNS



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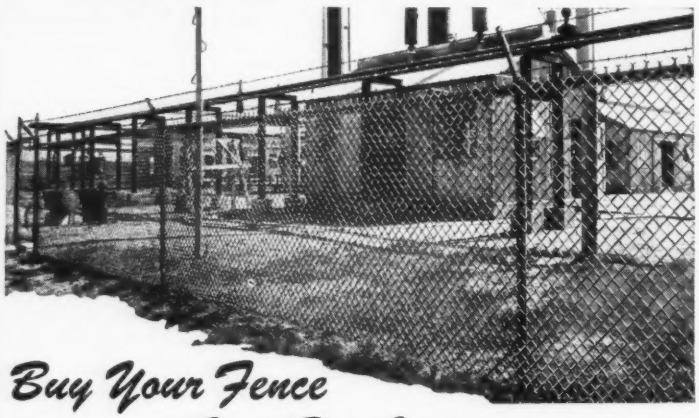

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Layne high efficiency Well Water Systems are precision built to very rigid standards of excellence. They embody the finest engineering features yet developed. For further convincing facts about Layne Well Water Systems and Layne high efficiency Vertical Turbine Pumps, write for literature. Layne & Bowler, Inc., General Offices, Memphis 8, Tenn.

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Layne Vertical Turbine pumps are available in sizes to produce from 40 to 16,000 gallons of water per minute. High efficiency saves hundreds of dollars on power cost per year.

AFFILIATED COMPANIES: Layne-Arkansas Co., Stuttgart, Ark. ★ Layne-Atlantic Co., Norfolk, Va. ★ Layne-Central Co., Memphis, Tenn. ★ Layne-Northern Co., Mishawaka, Ind. ★ Layne-Louisiana Co., Lake Charles, La. ★ Louisiana Well Co., Monroe, La. ★ Layne-New York Co., New York City ★ Layne-Northwest Co., Milwaukee, Wis. ★ Layne-Ohio Co., Columbus, Ohio ★ Layne-Texas Co., Houston, Texas ★ Layne-Western Co., Kansas City, Mo. ★ Layne-Western Co. of Minnesota, Minneapolis, Minn. ★ International Water Supply Ltd., London, Ontario, Canada ★ Layne-Hispano Americana, S. A., Mexico, D. F.

LAYNE

WELL WATER SYSTEMS VERTICAL TURBINE PUMPS

NATURAL GAS

Gwinville Field Spacing Decision Appealed

JACKSON, Miss.—Superior Oil Co., of Houston, Tex., has appealed to the State Circuit Court from the Mississippi State Oil and Gas Board's ruling setting 320-acre spacing for gas wells in Gwinville field, Jefferson Davis County.

The appeal followed the board's action on October 1 denying a petition of Superior and Fohs Oil Co. for 640-acre spacing in the field "for want of jurisdiction." The petition by the oil companies for 640-acre spacing was strongly protested by landowners in the Gwinville area, who sought 160-acre spacing for gas wells. After the board's entry of the 320-acre spacing order, the landowners appealed the case to the Circuit Court.

Cities Service Appeals Rate-Reduction Order

KANSAS CITY. — Cities Service Gas Co. has asked the United States Supreme Court to review the decision of the Tenth Circuit Court of Appeals which upheld an order of the Federal Power Commission requiring the company to reduce its rates by $4,455,871 annually on the basis of 1941 returns.

The company based its application for the writ of review on the premise that the commission erred in valuing the company's assets, lacked jurisdiction in certain phases of the case, and used improper methods in determining depreciation and tax figures.

Natural-Gas Sales Gain 1.7 Per Cent in August

NEW YORK.—Utility sales of natural gas in August totaled 1,629,500,000 therms, a gain of 1.7 per cent over 1,602.900,000 therms sold a year earlier. The American Gas Association's index of natural-gas sales in August stood at 183.2 per cent of the 1935-1939 average.

For the 12 months ending August 31, natural-gas sales were 22,492,700,000 therms, a decrease of 2.0 per cent under sales of 22,948,800,000 therms in the comparable period a year ago.

Sales of all types by the gas-utility industry to ultimate consumers in August totaled 1,834,181,000 therms, an increase of 2.3 per cent over sales of 1,793,776,000 therms in the same 1945 month, the association reported. The association's index of gas utility sales stood at 178.9 per cent of the 1935-1936 average for the month. For the 12 months ending August 31, 1946, sales were approximately 25,762,000,000 therms, a decline of 1.7 per cent under sales of 26,198,000,000 therms in the like period a year ago. (For statistical purposes 1 therm equals about 95 cu. ft. of natural gas).

T. G. & T. Rates Suspended

WASHINGTON. — A rate schedule in which Tennessee Gas & Transmission Co. proposed to increase the rate for natural gas sold to United Fuel Gas Co. in excess of volumes delivered on a firm basis, has been set aside by the Federal Power Commission. In an order suspending the schedule, the commission ordered a hearing to determine if the proposed rates are higher than those sought by T. G. & T. from other customers for gas sold under similar conditions.

FPC Approves Acquisitions

WASHINGTON. — The Federal Power Commission has made public an order authorizing United Fuel Gas Co. to acquire and operate properties and other assets of Huntington Development & Gas Co. and Warfield Natural Gas Co, Charleston, W. Va. The companies are subsidiaries of Columbian Gas & Electric Corp.

Gas Company Purchased

SCOTT CITY, Kans.—Kansas-Nebraka Natural Gas Co., Inc., has contracted to buy Tri-County Gas Co., subject to the technical approval of the Kansas Corporation Commission. The Kansas-Nebraska company operates a pipe line from southwest Kansas fields to Hastings, Neb. A. F. Payne, superintendent of distribution for Kansas-Nebraska, said the company is planning various improvements in Scott City and other areas.

Washington Office to Close

WASHINGTON.—The Washington office of the American Gas Association has been discontinued. Inquiries and requests for assistance on fuel problems involving government agencies should be addressed to the New York headquarters. A Washington telephone will be retained in the name of American Gas Association, and liaison maintained through arrangement with the Washington Gas Light Co., an A.G.A. announcement said.

Natural Gasoline

Magnolia Petroleum Buys Sabine Valley Gasoline

DALLAS.—R. M. Chan, vice president of Magnolia Petroleum Co., has announced the purchase by Magnolia of all stock and facilities of Sabine Valley Gasoline Co., Shreveport, La.

The transaction became effective October 1, and operations of the Sabine plant at Kilgore, Tex., were incorporated into Magnolia's East Texas operations.

Daily rated capacity of the plant is 60,000 gal. of gasoline and 60,000 gal. liquefied petroleum gases. Operating personnel of the plant will remain unchanged, it was said. Previous to the purchase, Magnolia was a principal buyer of Sabine's products.

Light-Products Output In July Shows Decrease

WASHINGTON.—Production of natural gasoline and related light products during July totaled 12,747,000 gal. daily, a slight decrease from the 13,091,000 gal. daily average in July, according to the monthly report of the U. S. Bureau of Mines. In barrels daily, the July total was 303,000, against 312,000 in June.

A drop in production in the Texas Panhandle accounted for the major part of the decrease. Here total July production fell to 35,247,000 gal. from 47,789,000 during June.

Stocks showed an almost negligible drop during the month. The total at the end of July was 308,015,000 gal. against 308,385,000 gal. at the end of June.

Purification Plant Completed

Shamrock Oil & Gas Corp. has completed a gas-purification plant for the sweetening of sour gas by the Girbotol process, as an addition to its McKee natural-gasoline plant near Dumas, Tex. The processed gas, with the sulfur and other undesirable fractions removed, is delivered to pipeline companies.

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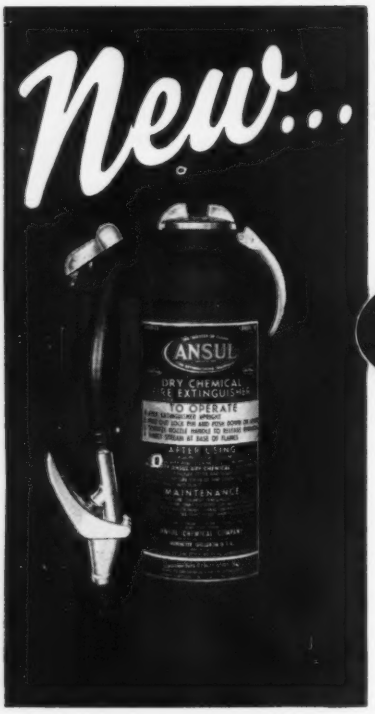

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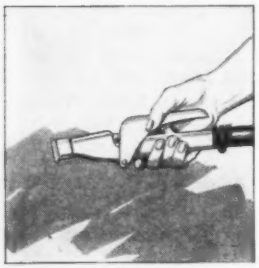
Install the NEW Ansul-Dugas Extinguishers at all hazard spots for greater protection against all fires involving flammable liquids, gases and electrical equipment.

Ready... in a Flash!

- Simply remove ringpin and push lever down.



- Open nozzle and direct chemical stream at base of flames.

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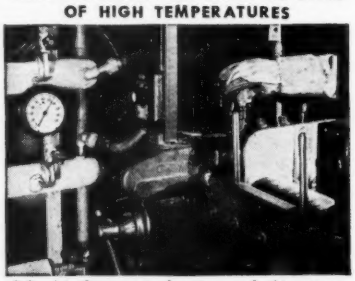
Silicone News

DC SILICONES

DC Silicone Greases Save Bearings—

KEEP MACHINES RUNNING IN SPITE OF HIGH TEMPERATURES



DC 44 Grease in bearings of this steam heated two roll mill gives effective lubrication at 300°F. In this application complete freedom from bleeding is essential because any oil on the rolls ruins the material being milled.

In almost every industry there are bearings which fail too soon, causing costly shutdowns, because operating temperatures are too hot for petroleum greases. More and more maintenance men and lubrication engineers are prolonging the life of such bearings by using DC 44 Silicone Grease for operating temperatures up to 350°F. and at speeds up to 20,000 r.p.m. For temperatures up to 475°F. and speeds of 4,000 r.p.m., DC 41 Grease is recommended. For temperatures in the range of −70°F., DC 33 is used.

Extensive testing of DC Silicone Greases indicates that they have from 8 to 10 times the service life of high quality petroleum greases at high temperatures. Weight losses range from 3.3% to 4.6% after 40 hours exposure to 175°C. (347°F.) compared with losses of 34% to 58% for high grade petroleum greases under the same conditions. Bleeding after 16 hours at 110°C. is less than 2% for DC 33 and DC 44.

Additional information about DC Silicone Greases is contained in data sheet No. Y 7-1.

DC 996—DC Silicone Greases were first used to lubricate bearings of silicone insulated motors subjected to accelerated-life testing, which includes operation at temperatures of 200° to 310°C. (392° to 590°F.) and exposure to 100% relative humidity. In 2½ years of continuous testing none of these silicone insulated motors has failed. Specifications and methods for applying DC 996 are given in leaflet No. Y 3-1.

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REFINING

New Catalytic Process for Aromatics Announced

A NEW catalytic process for the conversion of naphthas and gas-oil fractions largely to aromatic hydrocarbons has been announced in London by Petrocarb, Ltd.

Called Catarole process, this development is reportedly based on patents for the conversion of petroleum-type hydrocarbons to aromatics and olefinic products. These hydrocarbons are the raw-material basis of much modern synthetic development in organic chemicals, plastics, rubber, and other commercial products. The process is considered practicable as a supplement to the British coal-tar industry, "which is, and is likely to remain, the mainstay of the British chemical industry," the announcement said.

Approximately 50 per cent of the hydrocarbon charge stocks is converted to aromatics, producing almost the entire list of these materials: benzene, toluene, xylenes, ethylbenzene, styrene, alkylbenzenes, naphthalenes, anthracenes, phenanthrenes, and others which may be separated by fractional or azeotropic distillation and other methods.

Brief disclosures indicate that passing petroleum hydrocarbons through a tube packed with a metal catalyst such as copper at 630°-680° C. (1,166°-1,256° F.) and at 0.05-0.50 liters per hour per liter of catalyst volume yields a liquid product at least 95 per cent aromatic in content.

In addition to 50-per cent yields of liquid aromatics, some 20 per cent of olefinic gases are formed, including ethylene, propylene, butenes, and butadiene. Among the liquid aromatic products are naphthalene and eight alkyl substituted naphthalenes; anthrancene and three alkylanthracenes, fluorene, chrysene, pyrene, and various other polycyclic aromatics.

A pilot plant using the process has been operating since 1941, it was stated. A commercial plant is to be built on 700 acres near Manchester and is closely associated with the Manchester oil refinery group, with which Dr. Franz Kind, managing director of Petrochemicals, an affiliate, and Dr. G. Tugendhat, managing director of Petrocarb, Ltd., have been associated for some years.

The British patents under which these developments are licensed include: Nos. 552,216, 574,963, 574,973, 575,383, 575,766, 575,768, 575,769, and 575,771.

U. S. Motor Fuel M Octane Requirement Lowered to 72

The Federal Specifications Board has amended its standards for Motor Fuel M, lowering the octane requirement from 74 to 72 as a result of the tetraethyl lead shortage.

Other changes, according to information received by the Western Petroleum Refiners Association, provide

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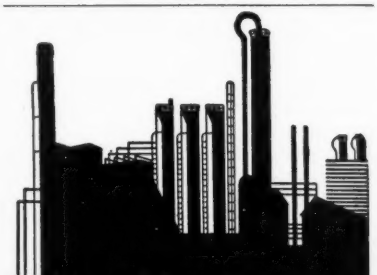
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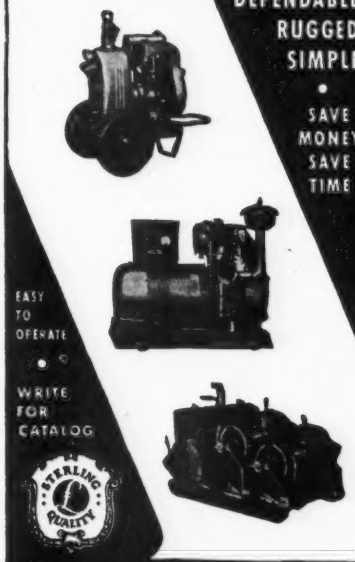
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an increase in permissible sulfur content from 0.10 to 0.25, specified additives must be approved by the board, abolished the 7-mg. per 100 cc. gum requirement at the point of delivery, and added the statement, at the point of manufacture, to the oxidation-stability requirement.

Shell Expanding Facilities For Methyl Ethyl Ketone

LOS ANGELES.—A $2,500,000 expansion program in facilities for production of methyl ethyl ketone and secondary butyl alcohol from petroleum hydrocarbons is well under way by Shell Chemical Corp. The expansion program is centered chiefly around installation of facilities for production of these chemicals at the corporation's Houston plant, according to J. Oostermeyer, San Francisco, president of Shell Chemical Corp. Productive capacity of Shell's facilities for these two chemicals will be increased about 150 per cent when the program is completed.

Contractor for expansion of the Houston facilities is C. F. Braun & Co., Los Angeles. Maximum production is scheduled to be attained by the third quarter of 1947.

Methyl ethyl ketone is a solvent used extensively in lacquers and lacquer thinners and in the manufacture of molded plastics, artificial leather, airplane dopes, and in the printing and lithographing industries. Secondary butyl alcohol is used also in lacquers and thinners and for making ore-flotation cmpunds.

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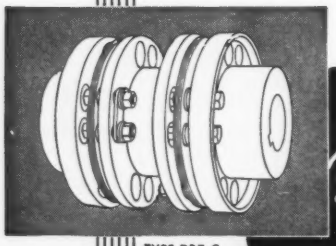
Flexible COUPLINGS
FOR HOT OIL PUMP DRIVES or any other service where 100% dependability is demanded



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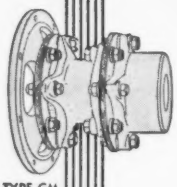

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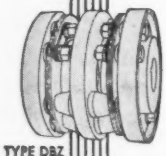

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THOMAS Flexible COUPLINGS provide for Angular and Parallel Misalignment as well as Free End Float . . . and Eliminate BACKLASH, FRICTION, WEAR and CROSS-PULL
NO LUBRICATION IS REQUIRED!

The Thomas All-Metal Coupling does not depend on springs, gears, rubber or grids to drive. All power is transmitted by direct pull.

Write for Complete Engineering Catalog!

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Contract Signed Allowing Carthage Hydrocol Plant

BROWNSVILLE, Tex.—A contract providing for construction of the $20,000,000 natural gas-to-gasoline plant was signed last week by Guy Gabrielson, president of Carthage Hydrocol Co., and officials of the Brownsville Navigation District.

The plant is to occupy 40 acres of land on the Brownsville ship channel. It was said work will be started next spring on the synthesis plant, first of its type in the nation.

British American Announces Vancouver Refinery Plans

VANCOUVER, B. C.—British American Oil Co., Ltd., will build a large modern refinery in the Vancouver area as soon as materials and equipment are available, according to an announcement by W. K. Whiteford, British American president.

Definite location for the plant has not been selected, but the site will be in the general upper-harbor area. Three refineries are now operating in British Columbia: Imperial Oil, Ltd., at Ioco, 16,000 bbl. daily crude capacity; Shell Oil Co. of British Columbia, at Shelburn, 4,200 bbl. daily crude capacity; and Standard Oil Co. of British Columbia, Ltd., at Vancouver, 5,000 bbl. daily crude capacity. British American operates five refineries, all in other Canadian provinces.

Refinery Sale Scheduled

HOUSTON.—War Assets Administration will open bids October 30 on equipment and facilities at the Baytown, Tex., aviation-gasoline plant which were not included in the sale of the property to Humble Oil & Refining Co. last July. Material not needed for the commercial peacetime operations which will be sold includes a hydrogenation unit, tank risers, gas-pressure regulation system, and sewage system.

Lion Oil Buys Building

EL DORADO, Ark.—As a part of a general expansion program, Lion Oil Co. has bought the Exchange Building, El Dorado's largest office building. "Expansion in operations and growth of the company necessitated more space, and Lion Oil will modernize and otherwise adapt and improve the building to its uses as materials and labor become available," said T. H. Barton, Lion Oil president.

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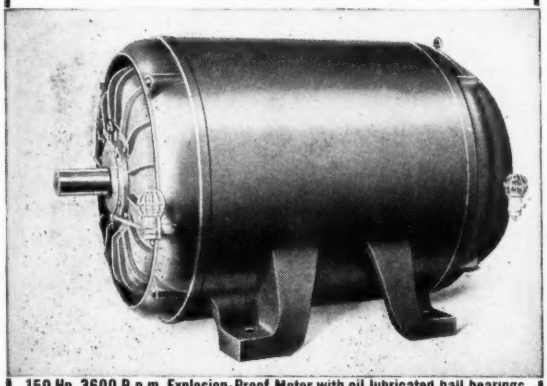
EXPLOSION-PROOF MOTORS
1 to 600 Hp.



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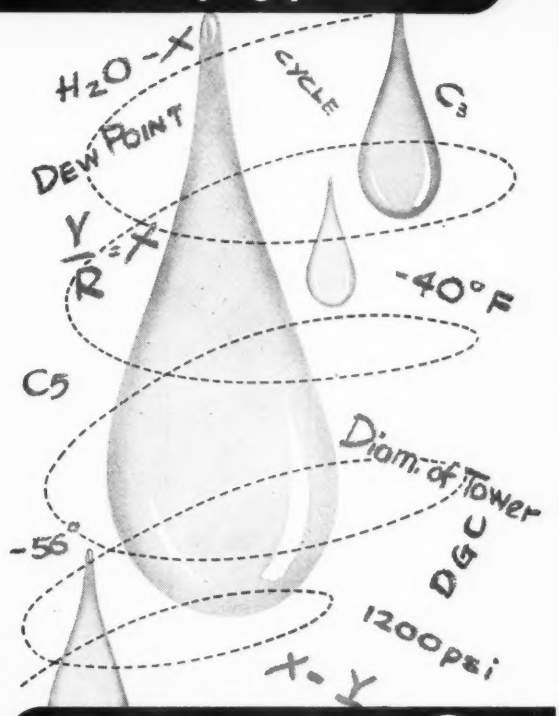

...work it out with DRIOCEL

Problems encountered in the drying of gases and liquids have the annoying habit of becoming process puzzles . . . taxing all the arts and sciences of the engineer. And, today's exacting requirements of low moisture content in many materials, adds to the quandary. But, to *know* how well a desiccant will perform solves much of the puzzle . . . and in many uses, under widely varying conditions, Driocel's superiority as a desiccant is performance-proved.

For instance, Driocel has exhibited a D.G.C. of approximately 10% when drying wet gas feeds presenting appreciable temperature, pressure and moisture ranges. Driocel produces dried gases of extremely low dew-point, below −57° F. What's more, its D.G.C. value is little affected by repeated regeneration. Driocel is just as efficient in the drying of hydrocarbon liquids, liquid organic chemicals, electrical oils, hydrogen, hydrogen sulfide and compressed air.

Reasons? Driocel is a "tool" built to do a job, by engineers who fully understand the function of a desiccant. It's made from selected bauxite ore, specially processed to insure high moisture adsorption and low iron content.

If you are faced with a drying problem, old or new, look into the merits of Driocel. It will perform a surprising job in most applications. And, you can be sure of sound advice on drying procedure when you write:

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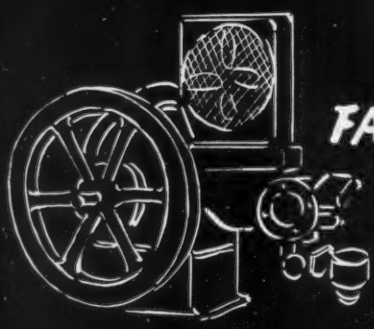

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* District offices and stores. † Sales Office.

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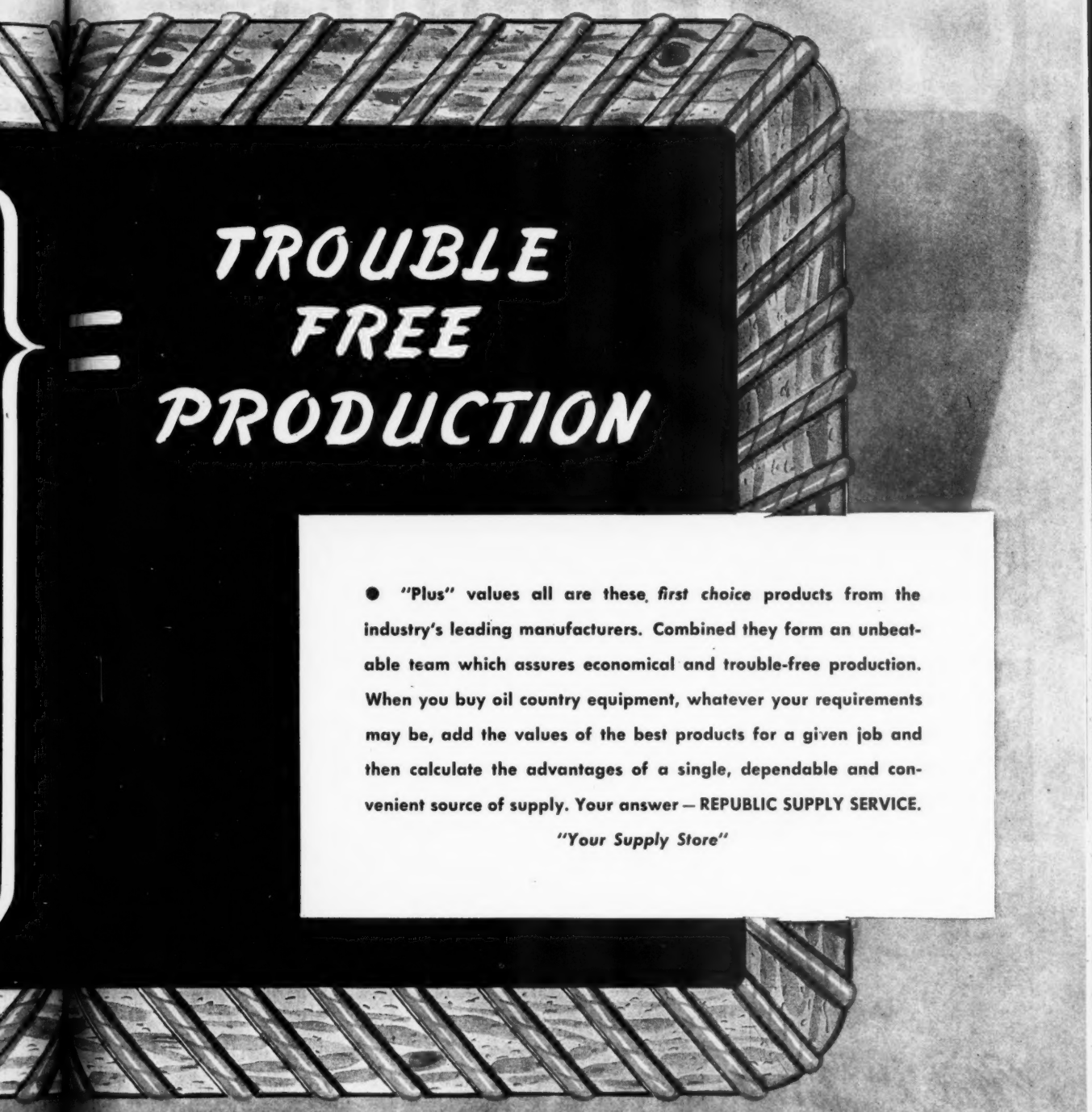

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above all
EXPERIENCE
Not just Contractors
but
PIPE LINE SPECIALISTS

PIPE LINES

Pipe Production Starts For California Gas Line

LOS ANGELES. — Coating and wrapping operations are now under way on the first 60-ft. lengths of 30-in. pipe which will be used on the California section of the Texas-Los Angeles natural-gas line.

B. H. Laulhere, in charge of the pipe-line construction work for the two California companies, Southern California Gas Co., and Southern Counties Gas Co., said the first lengths of pipe for the line have been received from the plant of Consolidated Steel Corp.

Operations at the adjacent coating and wrapping plant will be timed to coincide with those at Consolidated, Laulhere said. Capacity-output in pipe production is expected around the first of November.

Southern Natural Gas Proposes Expansion

BIRMINGHAM, Ala. — A request for permission to increase the capacity of its system by 50,000,000 cu. ft. daily was made last week by Southern Natural Gas Co. to the Federal Power Commission.

The company proposes to extend its service to Chattanooga, Tenn., and Lexington, Miss., with 138 miles of 20 and 22-in. lines, to parallel existing lines, and to add new compressors totaling 7,900 hp. at a total estimated cost of $8,000,000.

Construction has already started on 80 miles of 16-in. line connecting the system with the Gwinville gas field 40 miles south of Jackson, Miss., and the work is expected to be completed in December.

Buckeye Pipe Used for Transit & Storage Loops

Pipe is being cleaned, double-jointed, and beveled at yards operating at Laketon and North Jefferson, Ind., in the handling 120 miles of 8-in. pipe taken up from the Buckeye Pipe Line Co. system. Transit & Storage Co. is relaying 90 miles of this pipe in four loops on the company's system to Port Huron, Mich., and Sarnia, Ont. Laying operations are being conducted from headquarters at Maumee, Ohio, Wayne, Mich., and Columbus, Mich. Superintendents in charge of the work for the contractor, Williams Brothers Corp., are John Virgin, in charge of take-up, and H. F. Davis, in charge of laying operations.

Williams Brothers is finishing the last 5 miles of 200 miles of 18-in and

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Pipeline Cleaners Co.
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Better prepared to undertake any job in pipe line construction. Complete, modern equipment, experienced personnel, and a personal pride in giving you complete, satisfactory service in the shortest possible time—that's why we're doing a better pipe line job! When you plan your next pipe line, give us a call.

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Builders of Better Pipe Lines

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WICHITA FALLS • TEXAS

20-in. for East Ohio Gas Co. and 60 miles of 20-in. for Manufacturers Light & Power Co. A gang of this contractor is laying 20 miles of 10-in. for Kentucky Natural Gas Co. near Franklin, Ky. Other gangs of the firm are working for Minneapolis Gas Light Co.; Great Lakes Pipe Line Co., near Wells, Minn.; East Ohio Gas Co. in the city of Cleveland and Austintown, Ohio; Manufacturers Light & Power Co. near Hundred, W. Va.; Louisville Gas Co., Louisville, Ky.; and Atlanta Gas Co., Atlanta, Ga.

Sioux Falls-Watertown Line Opened by Great Lakes

KANSAS CITY, Mo.—Great Lakes Pipe Line Co. has completed an extension of its system north of Sioux Falls, S. D., through Marshall, Minn., to Watertown, S. D. The line comprising 78 miles of 8-in. between Sioux Falls and Marshall, and 72 miles of 6-in. between Marshall and Watertown, has been tested and placed in operation.

Initial deliveries are expected to be made at Watertown in tank cars October 14. Deliveries at Watertown into trucks will follow within a week or 10 days. For the next few weeks tonnage into Watertown will be confined to gasoline, but it is expected that distillates may be handled there beginning in December.

Reynosa Asks Construction Certificate From FPC

WASHINGTON.—A Federal Power Commission decision in about 2 months on the much-disputed gas-export plan of Reynosa Pipe Line Co. was indicated last week following a brief hearing before an FPC examiner.

Reynosa is seeking authority to build a 30-mile $750,000 pipe line to deliver up to 50,000,000 cu. ft. daily of natural gas from Hidalgo County, Texas, fields to the Mexican border where it would be carried to industrial concerns in Monterrey through another 135-mile, $3,000,000 line to be built by Gas Industrial de Monterrey.

In June, FPC authorized Reynosa to export the gas contingent, however, on commission approval of Reynosa's application for construction of the line. The Texas Railroad Commission and another Mexican gas company, Campania Mexicana de Gas, S. A., are opposing the Reynosa proposal.

In the hearing last week, Reynosa counsel contended the issues were settled in the June 6 order and that the construction application is merely a legal technicality. Robert T. Wilson, Reynosa president, told the examiner his company has made the necessary financial arrangements for the line.

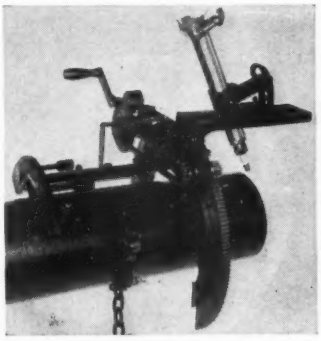
A Railroad Commission majority has indicated a last-ditch fight against

WHEN YOU WANT The *Best* IN PIPELINE CONSTRUCTION

OKLAHOMA CONTRACTING COMPANY
DALLAS TEXAS

SOUTH AMERICA
APARTADO 1085
CARACAS, VENEZUELA

Cut & Bevel Any Pipe
With
***Maximum* SPEED**
***Minimum* COST**

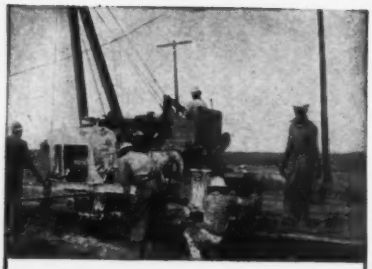


The H & M PIPE CUTTING and BEVELING MACHINE

SPEED: Complete cut and bevel can be made on 12 inch pipe in about 2 minutes.
ECONOMY: Save approximately one-half labor and gas costs.
PORTABILITY Can easily be carried from one pipe section to another.

Write for Literature

The H & M
Pipe Beveling Machine Co.
611 Petroleum Building, Tulsa, Oklahoma



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Reilly COAL TAR PRODUCTS

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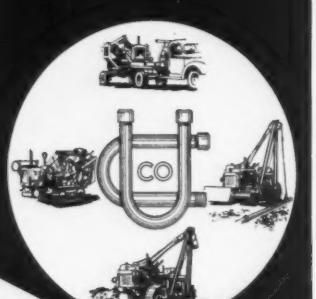
St. Louis Park, Minneapolis, Minn.

REPEAT BUSINESS
reflects our reputation as pipe line contractors



United
CONTRACTING CO.
28th and Layton Sts. - P. O. Box 7098
FORT WORTH 3, TEXAS

Among the group attending the Pipe Liners Reunion held at D Bar Ranch, north of Fort Worth, by C. Hobson Dunn, ranch owner and president of Eastern Construction Co., Inc., Dallas, were these executives: Dunn, who was host for the occasion; Harry K. Phipps, Socony-Vacuum Oil Co., Inc., Wichita, Kans.; R. R. Irwin, president of Socony-Vacuum's White Eagle Division; J. L. Latimer, president of Magnolia Petroleum Co. and Magnolia Pipe Line Co.; B. E. Hull, president of Texas Pipe Line Co.; A. N. Horne, vice president, Texas Empire Pipe Line Co.; and R. C. Sanders, Gulf Refining Co., Fort Worth

the plan on grounds it is a move to deplete the state of its natural resources. The commission has filed suit in the Fifth U. S. Court of Appeals in New Orleans asking that the export order of June 6 be set aside. In last week's hearing, the commission's attorney asserted the application for construction of the pipe line requires a showing of public convenience and necessity whereas no such burden of proof was needed in obtaining the export license.

Campbell Named Secretary For Corrosion Engineers

HOUSTON.—A. B. Campbell, formerly eastern representatve of Hughes Brothers, has accepted the position of executive secretary of the National Association of Corrosion Engineers, with headquarters in Houston.

Campbell is a graduate in electrical engineering of the University of Illinois and also has the professional degree of electrical engineer from the school. From 1915 to 1920 he was on the faculty of the engineering extension department of Iowa State College. From 1920 to 1923 he served as electrical engineer on the Iowa Board of Railroad Commissioners. He joined Hughes Brothers in 1943. The new executive secretary is a fellow of the American Institute of Electrical Engineers.

Magnolia Lets Contract

Contract for taking up and reclaiming 40 miles of 8-in. crude line between Maud and Stonewall, Okla., has been let by Magnolia Petroleum Co. to Bishop & Lock Construction Co. Work on the project has commenced.

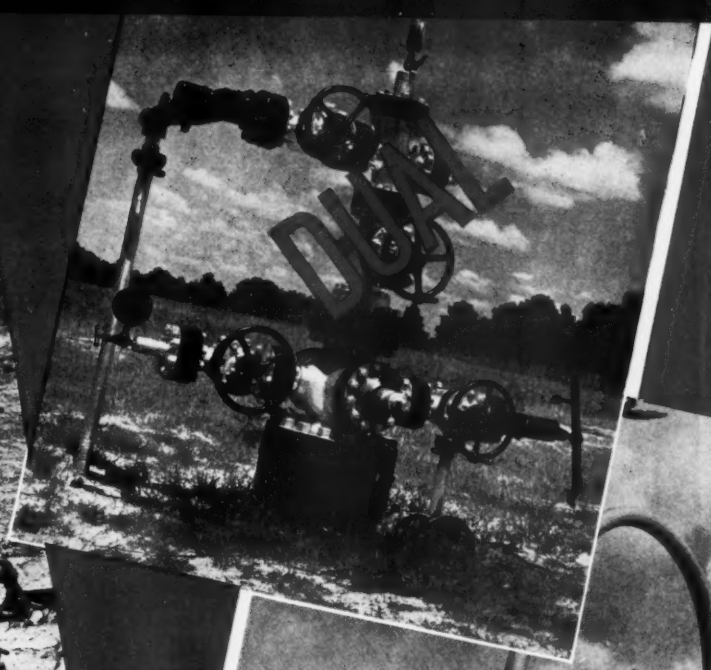
WRITE FOR LATEST INFORMATION
Improved LCN Pig
Assures Maximum Gas Thru-put

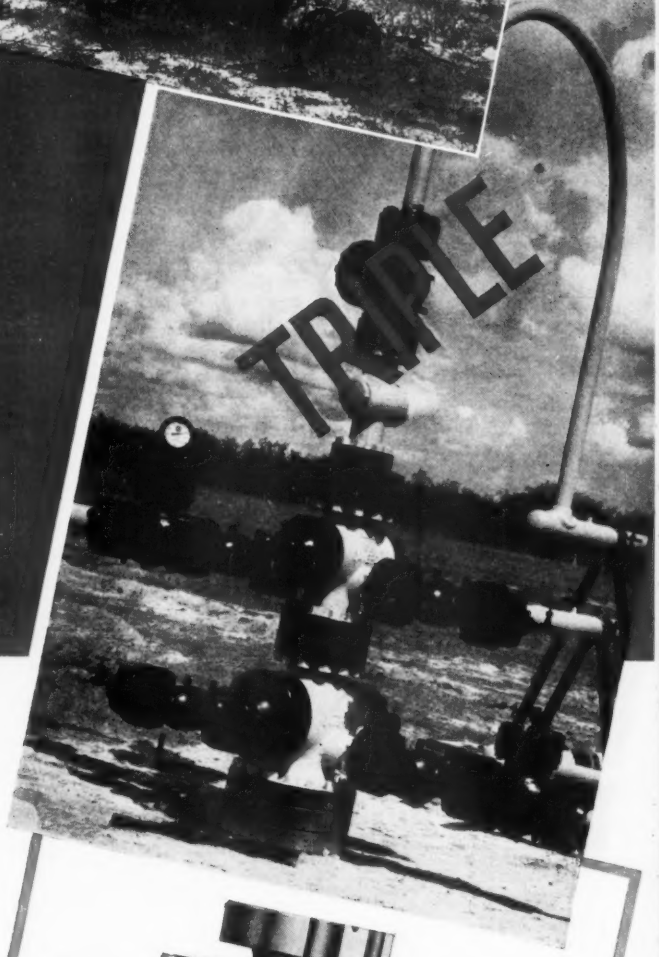
Type LCN Pipe Line Pig

- For internal cleaning of natural gas transmission lines.
- Sizes 16 to 26-inch, inclusive.
- Rugged, light-weight steel construction.
- High velocity gas, jetting through enlarged by-pass, sweeps debris ahead of Pig.
- Tough rubber scraper cups and tempered steel wire brushes scour pipe walls thoroughly.

Types RC and SCN Pigs available for cleaning gas lines smaller than 16-inch.

THE PIG WITH THE POKE CLEANS PIPE LINES
T. D. WILLIAMSON, Inc.
TULSA, OKLAHOMA





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CAMERON IRON

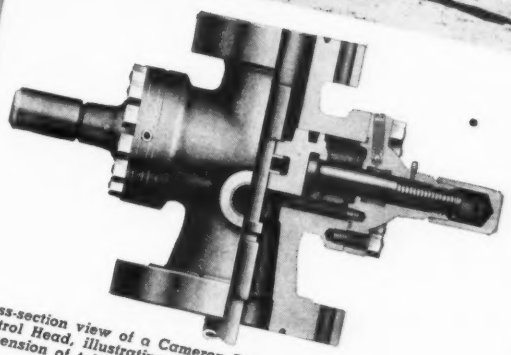
and take no chances!

For single, dual or triple zone completions, Cameron has the "iron" to do the job right. Surface equipment assembled on a Cameron Ram Type Tubing Head provides the last word in flexibility and dependable performance. Either of two proven completion methods may be used with this equipment: The Cameron Closed Pressure Method which employs a hanger nipple with back pressure valve suspended and sealed on the closed rams (see cut), or the so-called polished joint method which makes use of a hanger flange above the tubing head and utilizes the tubing head rams as a stuffing box. However, unlike conventional tubing heads, any joint of tubing, whether polished or not, may be worked through the closed rams of the tubing head.

Cameron Circulating Anchor Type Packers are unequaled for providing a pressure-tight separation of the producing zones. They are set by the weight of the tubing string and pulled by simply picking up on the tubing. The absence of J-tools and other complicated mechanisms make them the most positive setting and releasing packers available.

Add to this proven equipment Cameron's experience in all phases of multi-zone completion work resulting from hundreds of such completions under all known subsurface conditions.

Complete details will gladly be sent to interested operators on request.



Cross-section view of a Cameron Type "LD" Ram Type Tubing Control Head, illustrating the widely used hanger nipple type suspension of tubing.

CAMERON IRON WORKS, INC.

711 MILBY ST., HOUSTON, TEXAS

Export: 74 Trinity Place, New York, N. Y. West Texas: Telephone 1710, Odessa. Oklahoma: 310 Thompson Bldg., Tulsa. California: H. G. (Jeff) Musolf, 1442 Hayes Ave., Long Beach (7-2036)

STATISTICS and T

WEEKLY WELL COMPLETIONS . . . WEEK ENDED OCTOBER 12, 1946

	Total of all wells					Cum.		Wildcat completions and discoveries					Cumulative total, 1946				
	Comp.	Oil	Gas	Dry	Footage	1946	1945	Oil	Dist.	Gas	Dry	Total	Oil	Dist.	Gas	Dry	Total
New York	32	16	0	*16	43,862	1,239	1,143	0	0	0	0	0	0	0	0	0	0
Pennsylvania	78	40	6	†32	117,937	3,114	3,222	0	0	0	0	0	0	0	0	0	0
West Virginia	5	2	3	0	17,425	572	630	0	0	0	0	0	0	0	0	0	0
Ohio	26	8	13	5	77,688	968	744	0	0	0	0	0	3	0	12	31	46
Indiana	7	5	0	2	12,497	289	154	0	0	0	1	1	3	0	0	15	18
Kentucky	6	3	2	1	10,627	361	416	0	0	0	0	0	5	0	0	31	36
Illinois	54	23	0	31	142,423	1,794	1,401	3	0	0	13	16	42	0	1	348	391
Michigan	14	2	2	10	24,971	640	595	0	0	0	6	6	19	0	7	207	233
Kansas	39	20	6	13	122,696	1,555	1,341	2	0	0	2	4	25	0	1	201	227
Neb., Mo., Iowa	0	0	0	0	0	15	19	0	0	0	0	0	0	0	0	11	11
Oklahoma	72	38	8	26	207,752	2,181	1,893	2	0	1	4	7	68	0	32	266	366
Texas	130	82	12	36	578,286	6,177	5,630	7	0	0	21	28	173	23	27	1,015	1,238
North Central	34	21	0	‡13	85,892	2,196	1,734	5	0	0	5	10	58	0	4	417	479
West	30	26	0	4	155,946	1,347	1,391	1	0	0	4	5	42	0	1	143	186
Panhandle	10	7	3	0	30,587	259	441	0	0	0	0	0	0	0	0	5	5
Eastern	7	1	6	0	42,449	554	268	0	0	0	0	0	15	0	2	74	91
Gulf Coast	37	21	2	14	227,546	1,366	1,287	0	0	0	9	9	39	21	11	203	274
Southwest	12	6	1	5	35,866	455	509	1	0	0	3	4	19	2	9	173	203
Louisiana	32	21	3	8	161,597	1,069	815	0	1	0	3	4	42	10	7	148	207
Northern	20	11	3	6	65,682	605	332	0	0	0	2	2	8	0	2	82	92
Southern	12	10	0	2	95,915	464	483	0	1	0	1	2	34	10	5	66	115
Arkansas	1	1	0	0	4,210	141	139	0	0	0	0	0	7	0	0	30	37
Mississippi	3	0	0	3	17,501	192	291	0	0	0	2	2	1	0	1	54	56
Southeastern States	1	0	0	1	5,060	35	46	0	0	0	1	1	1	0	0	29	30
Montana	12	4	2	6	24,986	249	253	0	0	1	3	4	10	0	2	27	39
Wyoming	1	1	0	0	4,808	133	169	0	0	0	0	0	11	0	3	30	44
Colorado-Utah	4	4	0	0	25,261	122	42	0	0	0	0	0	4	0	0	14	18
New Mexico	24	21	3	0	70,481	319	327	0	0	0	0	0	3	0	0	30	33
California	17	6	1	10	68,789	1,247	1,790	1	0	0	7	8	21	0	4	175	200
Total United States	558	297	61	200	1,738,857	22,412	21,060	15	1	2	63	81	438	33	97	2,662	3,230
Total previous week	559	307	64	188	1,895,026	21,854	20,575	13	0	4	65	82	423	32	95	2,599	3,149
Total Oct. 13, 1945	485	251	61	173	1,661,352			4	1	1	60	66	406	19	111	2,687	3,223

Service wells included: *16, †31, ‡1.

MARKET QUOTATIONS

GRAVITY SCHEDULES

Top prices include all gravities above grades designated, and low prices include all gravities below grades designated:

Gravity—	Signal Hill, Calif.	Oklahoma, Kansas	Gulf Coast Texas	West Tex.*
18-18.9	$1.17	....	....	....
19-19.9	1.21	....	$1.41	....
20-20.9	1.24	$1.20	1.43	1.07
21-21.9	1.28	1.22	1.45	1.09
22-22.9	1.32	1.24	1.47	1.11
23-23.9	1.35	1.26	1.49	1.13
24-24.9	1.39	1.28	1.51	1.15
25-25.9	1.43	1.30	1.53	1.17
26-26.9	1.46	1.32	1.55	1.19
27-27.9	1.50	1.34	1.57	1.21
28-28.9	1.54	1.36	1.59	1.23
29-29.9	1.57	1.38	1.61	1.25
30-30.9	1.61	1.40	1.63	1.27
31-31.9	....	1.42	1.65	1.29
32-32.9	....	1.44	1.67	1.31
33-33.9	....	1.46	1.69	1.33
34-34.9	....	1.48	1.71	1.35
35-35.9	....	1.50	1.73	1.37
36-36.9	....	1.52	1.75	1.39
37-37.9	....	1.54	1.77	1.41
38-38.9	....	1.56	1.79	1.43
39-39.9	....	1.58	1.81	1.45
40 and above	....	1.60	1.83	1.47

*Includes Lea County, New Mexico.

(Quotations shown here are f.o.b. plant in tank cars and in cents per gal. as of last Monday. Crude prices reflect latest 25-cent advance except in California and Pennsylvania where no increase had been made as of Monday morning, July 29.)

REFINERY GASOLINE

Octane (A.S.T.M.)	78-78½†	73-75
Mid-Continent*	7.375-7.625	6.625-7.000
Tex. Gulf Coast	7.250	6.500-6.750
New York Harbor	8.750-9.500	7.750-8.500
California		6.250-6.750

*Basic Oklahoma Group 3. †1939 C.F. R. (research method).

NATURAL GASOLINE

Grades—	26-70	18-55
Oklahoma (Group 3)	4.750	5.700
N. Texas (f.o.b. plant)	4-4.25	4.8-5.1
N. Louisiana (f.o.b. plant)	4.500	5.400
California (averages)	5.500	6.250

CRUDE-OIL PRICES

Representative posted schedules per bbl.

East Texas	$1.60
Kettleman Hills, California*	1.69
Beauregard Parish	1.55
Illinois Basin	1.72
Pecos County, Texas	1.30
Bradford, Pennsylvania	3.41
Eastern Ill., and Western Ind.	1.57

Note: Exclusive of subsidy.
*For 37-37.9 gravity.

A.P.I. REFINERY REPORT

Week ended October 5, 1946

(Figures in thousands of barrels)

	Dly. crude runs to stills	Stocks— Gasoline	Distillate	Residual
East Coast	800	21,080	23,343	12,136
Appalachian	147	2,940	734	600
Ill., Ind., Ky.	798	15,535	8,816	5,415
Okla., Kan., Mo.	379	8,378	3,555	1,394
Inland Tex.	197	2,626	616	784
Tex. Gulf Cst.	1,203	11,910	9,383	7,689
La. Gulf Cst.	326	4,517	3,261	1,878
N. La., Ark.	59	1,699	419	241
Rocky Mtn.	135	1,484	632	820
California	821	15,240	11,455	27,654
Total 10-5-46	4,865	85,409	62,214	58,611
Total 9-28-46	4,829	85,324	59,827	57,657
Total 10-6-45	3,360	71,901	44,014	46,687

CRUDE-OIL STOCKS

(Bureau of Mines Estimate)

Week ended—	Bbl. of crude*
October 5, 1946	221,782,000
September 28, 1946	223,043,000
October 6, 1945	224,573,000

*Excludes unrefinable Calif. stocks.

TRENDS

DAILY AVERAGE PRODUCTION FOR WEEK

	Oct. 12 crude oil	B. of M. Oct. demand	Oct. 5 crude oil
Alabama	1,050	1,200	1,000
Arkansas	78,650	77,000	78,650
California	869,200	850,000	869,700
Colorado	36,940	32,000	35,980
Eastern	67,250	64,200	69,350
Florida	0	200	15
Illinois	206,900	214,000	205,900
Indiana	18,750	19,000	19,050
Kansas	271,300	264,000	267,350
Kentucky	30,600	30,000	30,500
Louisiana	401,650	383,000	401,750
North Louisiana	96,750	.....	96,850
South Louisiana	304,900	.....	304,900
Michigan	50,525	47,000	46,475
Mississippi	74,205	60,000	74,055
Montana	24,680	24,000	24,240
Nebraska	700	800	700
New Mexico	99,250	100,000	99,250
Oklahoma	352,650	384,000	355,350
Texas	2,064,300	2,120,000	2,064,300
District 1 (Southwest)	19,425	.....	19,425
District 2 (Southwest)	146,400	.....	146,400
District 4 (Southwest)	216,700	.....	216,700
District 3 (Gulf Coast)	455,900	.....	455,900
District 5 (Eastern)	40,300	.....	40,300
District 6 (Eastern)	102,900	.....	102,900
East Texas field	320,300	.....	320,300
District 7C (West)	27,300	.....	27,300
District 8 (West)	487,500	.....	487,500
District 7B (W. Central)	33,225	.....	33,225
District 9 (N. Central)	129,400	.....	129,400
District 10 (Panhandle)	84,950	.....	84,950
Wyoming	108,010	100,000	107,760
Miscellaneous other	.....	600	.....
Total United States	*4,756,610	4,771,000	4,751,375
Change from prev. week	up 5,235		

Total production January 1-October 12 ..... †1,352,444,825 bbl.
Same period last year (crude, plus condensate) 1,351,463,825 bbl.
*Not incl. 22,670 bbl. condensate. †Incl. 6,891,380 bbl. condensate.

CRUDE-OIL STOCKS 221,782,000 bbl. as of October 5—down 1,261,000 bbl. One year ago 224,573,000 bbl.

GASOLINE STOCKS 85,409,000 bbl. as of October 5—up 85,000 bbl. One year ago 71,901,000 bbl.

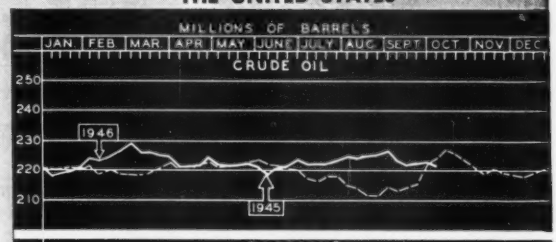
RESIDUAL FUEL-OIL STOCKS 58,611,000 bbl. as of October 5—up 954,000 bbl. One year ago 46,687,000 bbl.

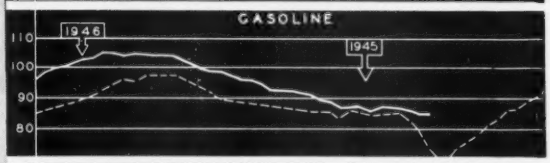
GAS OIL AND DISTILLATE STOCKS 62,214,000 bbl. as of October 5—up 2,387,000 bbl. One year ago 44,014,000 bbl.

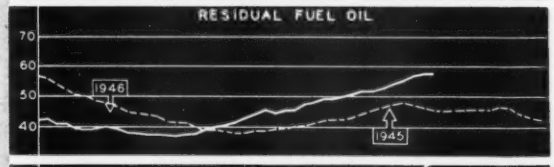
CRUDE-OIL PRODUCTION 4,756,610 bbl. as of October 12—up 5,235 bbl. One year ago 3,618,450 bbl.

REFINERY RUNS 4,865,000 bbl. daily week ended October 5—up 36,000 bbl. One year ago 3,360,000 bbl.

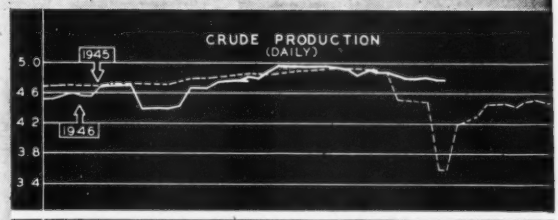
OIL STOCKS IN THE UNITED STATES

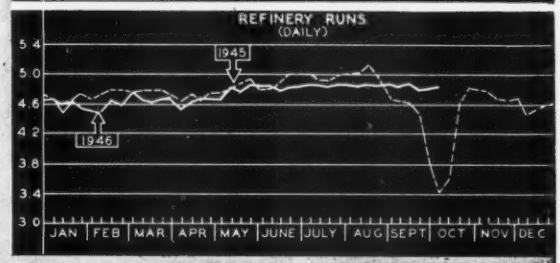




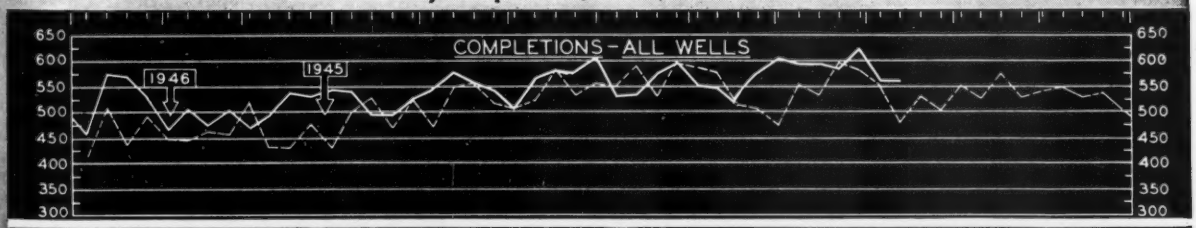


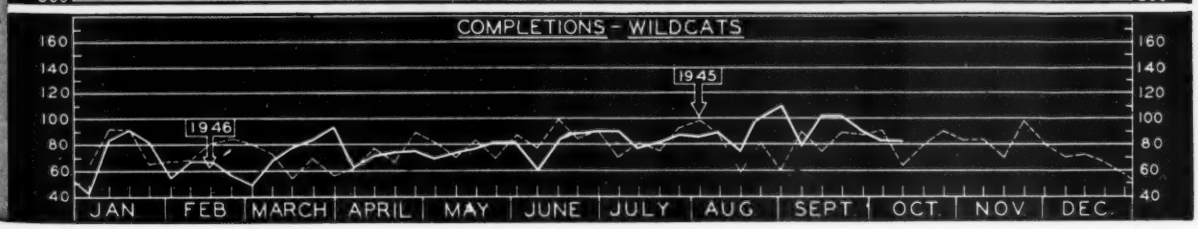
DAILY OPERATIONS





Solid line charts weekly completions, service wells in Eastern area included





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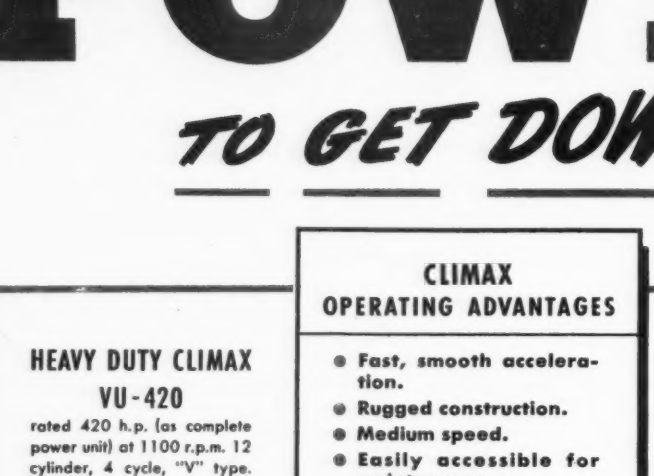
HEAVY DUTY CLIMAX VU-420

rated 420 h.p. (as complete power unit) at 1100 r.p.m. 12 cylinder, 4 cycle, "V" type.



CLIMAX OPERATING ADVANTAGES

- Fast, smooth acceleration.
- Rugged construction.
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Exploration and Drilling

Low-Cost, Deep Drilling

DRILLING a 6,740-ft. wildcat in hard-rock country for a cash outlay of $2 per foot, exclusive of casing, is a real achievement. That it was done by cable-tool rig will be a real surprise to many people. Daniel A. Busch, geologist with Huntley & Huntley, told the Engineers Society of Western Pennsylvania some of the details.

Industrial Gas Co., of Newark, Ohio, drilled its 1 Whitmire, SE SE Section 26, Salt Creek Township, Muskingum County, Ohio, for the following cash outlay: Payroll, taxes and transportation $7,800; 5,500 ft. of ⅞-in. drilling line, $1,200; 2,000 ft. of 1-in. drilling line, $500; 6,000 ft. of ½-in. sand line, $450; miscellaneous supplies and expenses, $3,500; total $13,450 for 6,740 ft.

When the well was spudded on June 24, it was intended to be about a 4,500-ft. test to the Clinton and Medina sands. When it was abandoned as a dry hole, 82 days later, it was 36 ft. into the St. Peter sand, topped at 6,704 ft. The Clinton and Medina, at 4,324-74 ft., and 4,433-39 ft., respectively, had been found dry. Some gas shows had been found in the almost 800 ft. of Trenton lime section drilled through, 5,800-6,591 ft., and salt water encountered in the St. Peter. The smallest string of casing used was 5⅜ in. set at 4,060 ft., above the Clinton, which left 2,680 ft. of open hole to total depth.

A standard rig with usual equipment was employed. A 40-hp. Franklin engine was used to a depth of 5,390 ft., when it was replaced with a 65-hp. Franklin. A ⅞-in. drilling line was used to a depth of 5,250 ft., where 2,000 ft. of 1 in. was spliced on to produce a tapered line. At this same depth, the original bullwheel was replaced by a new one. The new bullwheel had an 18-in. heavy shaft and a single 14-in. brakeband. The sand line was lengthened at irregular intervals by splicing on sections of a new line. The average drilling rate, from spudding to completion, was approximately 82 ft. per day.

The cost data do not, of course, include overhead, taxes, or depreciation for wear and tear on the equipment. Nor is the cost of necessary casing included. On the other hand, the elimination of these items will enable many operators to make direct comparisons with some of their own wells.

With St. Peter tests few and far between in this area, the extra cost beyond the Clinton-Medina horizons will generally be considered a small investment for the geological information obtained.

SOUTHWEST TEXAS

Deep Condensate Discovery Completed in Kleberg

CORPUS CHRISTI.—A new deep condensate discovery has been completed in Kleberg County, 1⅝ miles southeast of the Tijerina-Canales field, at Sun Oil Co. 4 E. G. Canales. This well is in southwest corner of CCSD&RGNG Survey 339. On a test it flowed 91 bbl. of condensate and 23 bbl. of water per day through a ¼-in. choke, with gas volume estimated at 3,000,000 cu. ft. per day. Total depth is 11,554 ft. Production is through perforations at 10,830-40 ft.

Mackhank Petroleum Co. 1 W. D. Walton et al, discovery well of the first oil production in the Cosden-Wilcox field of Bee County, flowed 117 bbl. of 37°-gravity pipeline oil per day through a ⅛-in. choke through perforations at 7,066-72 ft. in the Wilcox zone. Gas-oil ratio was 2,125 to 1, tubing pressure 1,350 lb. and casing pressure 2,450 lb. This well is located ⅘ mile southwest of the company's 1 Freeland, gas-condensate discovery well, and is in the John Pace Survey.

Hecar Oil Co. 1 Jamie Hynes, a wildcat test 3 miles north of Refugio in John Malone Survey, Refugio County, is now fishing for lost swab. On original completion attempt through perforations at 6,412-20 ft. it had flowed 47 bbl. of clean oil per day through a ⅛-in. choke, with 900 lb. tubing pressure and 1,725 lb. casing pressure, but later began making 40 per cent salt water and operators squeezed perforations. New perforations were made at 6,412-16 ft., and it was while operators were swabbing in that swab was lost in the hole. Total depth is 6,465 ft.

Magnolia Petroleum Co. 2 F. Armendaiz, wildcat in extreme southeast corner of Willacy County, tested a good gas-condensate sand at 8,596-8,636 ft. The 5½-in. casing was set on bottom at 9,694 ft., and operators are preparing to test.

There were 10 wildcat locations included in the 42 new locations for this week, 2 being in Jim Wells and Webb, and 1 each in Bexar, Goliad, Live Oak, Starr, and Williamson counties. Starr County received the greatest activity with seven new locations reported. There were 24 oil wells completed, 1 being a new pool opener in Duval County, 2 gas wells, and 10 dry holes. Eight of the dry holes were wildcats, one each in Atascosa, Bee, Bexar, Brooks, Cameron, Duval, Live Oak, and Nueces counties. Duval and Kleberg counties each received four completions, while Bee, Karnes, Refugio, and Jim Wells counties received three each.

SOUTHWEST TEXAS SUCCESSFUL WILDCAT

Duval County: New oil pool, North Peters; Humble 1-F Dallas Joint Stock Land Bank, GB&CNG Sur. 187, top pay 2,092 ft., TD 2,429 ft., perf. 2,092-98 ft., PT 18 bbl. net oil per day through a ¼-in. choke, TP 25-100 lb., SIP 390 lb., gravity 22°, 40 per cent water.

SOUTHWEST TEXAS WILDCAT FAILURES

Atascosa County: Humble 1 Edward Matecha, in William McFaddin Sur. 522, 2 mi. E of Charlotte, dry, TD 7,252 ft.

Bee County: W. Earl Rowe et al 1 T. J. Heard, Washington Stevens Sur., 5 mi. S of Berclair, dry, TD 4,200 ft.

Bexar County: Walter H. Bode and Pegg Bros. 1 John Lowe, Henry Verm Sur. 195, 3 mi. NE of Lytle, dry, TD 989 ft.

Brooks County: H. H. Howell 1 L. Villareal, CCSD&RGNG Sur. 809, Alta Verde area, dry, TD 4,094 ft.

Cameron County: Phillips 1 R. L. Roloff, Arroyo Gardens, Unit 1, 10 mi. NE of San Benito, dry, TD 12,496 ft.

Duval County: J. W. Gorman et al 2 Florence D. Lowe, AB&M Sur. 76, dry, 2,705 ft.

Live Oak County: Humphries & Hotchkin 1 Elroy and Eugene Adlof, Bridget Haughey Sur., 2½ mi. NE of Three Rivers, dry, TD 2,094 ft.

Nueces County: L. M. Lockhart 1 J. W. Porter, John J. Elliff tract, 4 mi. NE of Banquete, dry, TD 6,860 ft.

N. CENTRAL TEXAS

Montague County Wildcat Reported Dry

WICHITA FALLS.—Although one Montague County wildcat that had been watched with considerable interest was reported dry last week, activity is high in the county. Phillips Petroleum Co. 1 S. D. Howard Alco, Guadalupe College Survey, A-267, 6 miles south of Belcherville, was given up at 6,430 ft. Tops reported were: Canyon lime 1,920-2,008 ft., Palo Pinto lime 2,775-2,865 ft., Lawler lime 2,998-3,110 ft., Smithwick shale 5,690-5,924 ft., first Caddo lime 5,924-60 ft., conglomerate at 6,031-39 ft. with a slight show of oil. Second Caddo was logged at 6,055-6,130 ft., and second conglomerate at 6,130-48 ft. Barnett shale was topped at 6,265-6,383 ft., and Viola lime at 6,383-6,430 ft., where a slight show of oil was found in the top of the zone.

Other Montague wildcats were: Continental Oil Co. 1 G. L. Griffin, William Bartee Survey, A-30, 2 miles southwest of the town of Bowie, was drilling ahead below 600 ft. Continental's 1 T. R. Copeland, N. Kimbro Survey, A-405, a 6,600-ft. test 4

miles northeast of Stoneburg, had derrick up last week and was moving in rotary. Magnolia Petroleum Co. 3 Hinds Clark, James Smith Survey, A-687, in the Hildreth field, 7 miles north of Montague, was drilling below 3,060 ft. in shale.

Nine miles northwest of Snyder, in Curry County, Seaboard Oil Co. of Delaware last week was getting under way at their 4,000-ft. wildcat test, the 1 J. R. Randall, Section 257-97, H&TC Survey. Seaboard has a block of approximately 3,000 acres, with Magnolia and Phillips owning leases offsetting the location.

In western Shackelford County, Dean Brothers opened a second producing horizon in the southeast corner of Section 114, ET Survey. The firm recently completed its 9-K Newell for 30 bbl. of oil daily from the Bluff Creek sand at 1,300 ft., while wells completed during the last 2 years have been from the Cook sand at 1,480 ft. Cook sand production in the field is outlined by several dry holes.

NORTH CENTRAL TEXAS SUCCESSFUL WILDCATS

Cooke County: 2 mi. S and 1 mi. E. Myra; Douglas Helms 2 Lee Blocker, Rodriquez Sur., 70 bbl. oil at 1,582 ft.

Jones County: New pool ½ mi. E Nugent; H. W. Elliott 1 Roberts, pumped 16 bbl. at 1,652 ft., gravity 36°.

Wichita County: 3 mi. S and 1 mi. W. of Burkburnett; Akin & Dimock 1-A E. E. Hardin, pumped 12 bbl., TD 1,407 ft.

Wilbarger County: 6 mi. S of Vernon; E. C. Lawson 2 W. J. Baker, Sec. 85, Blk. 13, H&TC Sur., pumped 93 bbl. in Canyon, 3,230-3,310 ft.

NORTH CENTRAL TEXAS WILDCAT FAILURES

Archer County: ½ mi. W of Windthorst; L. T. Burns 1 F. J. Schroeder, Sec. 27, Blk. 4, Clark & Plumb Sub., dry at 1,900 ft.

L. T. Burns 1 J. H. Rayborn, 3 mi. S and 2½ mi. E of Dundee, Blk 3, SPRR Sur., A-435, dry at 1,883 ft.

A. R. Dillard 4 Mrs. Anna Herndon, 6 mi. S and 2 mi. W of Mankins, Sec. 1, SPRR Sur., A-434, dry at 1,645 ft.

Montague County: 5½ mi. S and 1½ mi. E of Belcherville; Phillips Pet. 1 W. B. Clark, Guadalupe College A-267, dry at 6,430 ft., Barnett 6,265 ft., Viola 6,385 ft.

Young County: 3½ mi. N and 3 mi. E of Newcastle; Hanlon & Buchanan 1 M. K. Graham, Sec. 618, TE&L Sur. A-709, dry at 5,000 ft.

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PERMIAN BASIN

Shell Will Test Northeast Crockett County

MIDLAND.—Shell Oil Co., Inc., last week staked location and started operations at its 1 University, an 8,500-ft. wildcat on a 318.5-acre tract acquired by Shell at the November University Lands sale and for which a cash bonus of $72,000 was paid. Location is 680 ft. from north line and 638 ft. from west line in Section 21, Block 39, University Lands. Operators are showing considerable interest in this test.

Another location in the Permian basin, but in Andrews County, was Fred Turner, Jr.'s 1 M. M. Fisher Estate, in Section 16, Block A-36, Public School Lands Survey. This wildcat will try to extend the east side of Shafter Lake and will be drilled to 5,000 ft. in the San Andres. Location is 1 mile north of the Texas Co. 1 E. B. Jones, which was completed for 154 bbl. of oil at 4,490 ft.; and is about ¾ mile northwest of a dry hole at 4,083 ft., top of the Andres. Elevation at the latter test was 3,162 ft.

In Ward County, Phillips Petroleum Co. 1-B University, Section 28, Block 16, University Lands, was reported to have recovered 500 ft. of oil-cut mud and 360 ft. of oil on a 2-hour drill-stem test at 9,300-9,436 ft. in the Wolfcamp zone. This is an old well deepened from 5,020 ft. Location is 1 mile southeast of the Pyote Army air base, and operations were said to have been suspended during the war due to its closeness to the air field.

In Reeves County, about 6 miles northeast of Saragosa, Argo Oil Co. 1 Dora Roberts, Section 294, Block 13, H&GN Survey, plugged back from total depth of 14,076 ft. to 12,150 ft. and cemented 5-in. casing at 9,895 ft.

New work in West Texas last week included three locations in the Keystone Ellenburger field, two in the Keystone Devonian, and two in the Slaughter field of Cochran County.

WEST TEXAS SUCCESSFUL WILDCATS

Ward County: New pool in Reef area; Roy D. Golston 1 W. L. Moody Est., Sec. 32, Blk. 34, H&TC Sur., elev. 2,537 ft., TD 2,725 ft., in lime, PB 2,550 ft., flowed 30 bbl. oil in 24 hrs., from Yates sand topped at 2,485 ft., gravity 31°.

WEST TEXAS WILDCAT FAILURES

Fisher County: 2 mi. E of Longworth; T. A. Kirk and L. H. Choate 1 T. G. Stevenson, Sec. 5½, John Rodman Sur., elev. 2,003 ft., dry at 6,116 ft., Ellenburger 6,045 ft.

Glascock County: 6½ mi. NE Garden City; C. T. McLaughlin 1 A. D. Neal, Sec. 48, Blk. 33, Twp. 3s, T&P Sur., elev. 2,745 ft., dry at 3,501 ft. in lime.

Howard County: 9 mi. NE Big Springs; Santa Fe Petroleum 1 M. T. Christian, Sec. 48, Blk. 32, Twp. 2n, T&P Sur., elev. 2,628 ft., dry at 4,162 ft. in lime.

Lynn County: 7½ mi. NW O'Donnell; Ray A. Albough 1 G. L. Sutton, Sec. 22, BHEL&RR Sur., dry at 7,505 ft. in

lime Yates sand 2,850 ft., brown lime 3,780 ft.

SOUTHEASTERN NEW MEXICO

HOBBS.—Barnsdall Oil Co.'s 1 Hardy established lower Permian production between the Penrose-Skelly field and Drinkard field in east central Lea County last week when it flowed, without acid, 135 bbl. of oil in 24 hours through ¼-in. choke on tubing at 6,514-6,652 ft. Barnsdall and Magnolia were said to be planning a joint north offset to the extension well.

East of the 1 Hardy, Rowan Drilling Co. and Neville G. Penrose, Inc., 4 Walden flowed 15.6 bbl. of oil in 1 hour after treating with 500 gal. of acid at 6,460-6,518 ft. Location is in 15-22s-37e.

Amerada Petroleum Corp.'s 1-A Hare, 33-21s-37e, on the northwest side of Drinkard, and which last week flowed at the rate of 19 bbl. of oil an hour, had hole bottomed at 6,650 ft., drilled out to 6,595 ft. and was preparing to perforate casing for another test. On last report it was swabbing down.

In Eddy County, a lower Permian test was scheduled last week. Mesa Retailers Corp. will drill the 1 Blind Snake, 7 miles northwest of Artesia in 2-16s-25e. The wildcat is to go to 6,000 ft.

In Roosevelt County, some 35 miles southeast of Portales and on a block of 9,000 acres, Continental Oil Co. and Cooperative Refinery Association will drill their 1 Alston Unit. Location is SE SE 20-7s-35e. Contract calls for a 5,000-ft. test, although operators were said to have planned on drilling to granite if the San Andres is found dry.

TEXAS GULF COAST

New Pool in Prospect For North Houston Area

HOUSTON.—Union Producing Co. 1 Nell S. Allen, a prospective new pool opener in the North Houston area, Harris County, in WCRR Survey, Block 4, is preparing to complete through christmas tree connections. On an initial test through perforations at 7,478-88 ft., the well flowed gas and condensate ungaged, flowing pressure on the tubing 2,600 lb., and a shut-in pressure of 2,600 lb. with 1,400 lb. casing pressure. Total depth is 7,606 ft. and 5½-in. casing is on bottom. A test made through 1 ft. of perforated pipe at 7,299-7,300 ft. failed to flow and a recovery of 6 joints of mud with no shows was made.

Cockburn Oil Corp. and H. C. Cockburn 2 O. P. Woodburn, north of Friendswood, in Harris County, is expected to open a new gas pool but operators are unable to get a production test. Well would not kick off after operators washed the screen out. Screen is being pulled for a new setting. Total depth is 6,518 ft. and 5½-in. casing is cemented at 3,853 ft., with perforations at 3,356-62 ft.

Jack W. Frazier 1 Houston Deep Water Land Company, is still cutting and pulling pipe after blowout. Hole was washed down to 2,815 ft. and operators are now making a cut at 2,775 ft. Total depth is 8,379 ft. While drilling at that depth the well kicked and started blowing dry gas. Flow was controlled and operators started out of hole with drill pipe. After pulling 21 stands, the pipe became stuck.

There were 19 new locations this week, 5 being wildcats, 1 each in Austin, Brazoria, Chambers, Harris, and Matagorda counties. There were four dry wildcats completed, one each in Brazoria, Fayette, Grimes, and Liberty counties.

UPPER GULF COAST WILDCAT FAILURES

Brazoria County: General Crude Oil Co. 7 Belle H. Wisdom, Damon Mound area, Abraham Darst Sur., dry, TD 4,744 ft.

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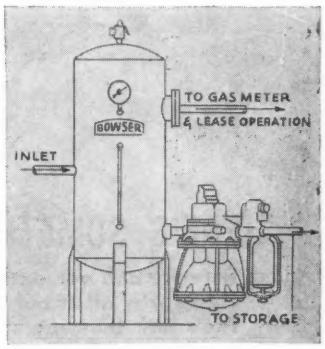

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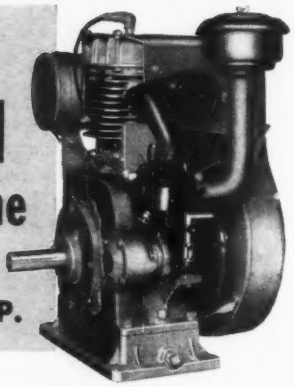

Illustrated above is the Models AEH to AHH series of 4-cycle single cylinder Wisconsin Air-Cooled Standard Engines, to which the following specifications apply:

MODEL	AEH	AFH	AGH	AHH
Bore	3"	3¼"	3½"	3⅝"
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Cu. in. Displ.	23	38.2	38.5	41.3
Hp. Range	4-6	5-7	6-8.5	7-9
Weight	130 lbs.	170 lbs.	175 lbs.	180 lbs.

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Fayette County: W. J. Rasnik 1 Theo. Krakosky, La Ward area, Hy Clement Sur., dry, TD 4,020 ft.

Grimes County: Humble 1 Geo. Sealy, Trustee, in Ben F. Smith Sur., 4½ mi. SW of Singleton, dry, TD 7,893 ft.

Liberty County: Grubb & Hawkins 1 E. B. Pickett, Jr., et al, T&NO Sur. 14, 2 mi. NE of Cotton Wood discovery well, dry, TD 8,325 ft.

CANADIAN FIELDS

Lloydminster Extended To West and North

CHATHAM.—In the Dina-Ribstone area north and west of the proven Lloydminster field, Lloydminster Oil Producers 3, LSD 3, 11-50-2w4, finished at 2,003 ft., has initial pumping production of 100 bbl. The oil is 15° gravity, the lightest in the field, with the sand at 1,993 ft. The strike extends the field 4 miles west and 2 miles north. In the main field, Patricia 2, LSD 16, 1-49-1w4, is deepening from 1,889 ft. Midfield 7, LSD 15, 26-49-1w4, has spudded.

In the Saskatchewan end of the field, Husky Oil & Refining 4, LSD 4, 14-47-27w3, drilled on Oil & Gas Development Co. acreage near Lone Rock, got a gas sand at 1,813 ft. with flow estimated at 4,000,000 cu. ft. Drilling was continued through shale into an oil sand, giving a rise of 300 ft. of gassified crude, with 100 bbl. production indicated. Testing is being continued, and additional wells will be drilled. The strike extends the potential field about 10 miles southeast.

Midway between the Husky well and the old field, D. B. Syndicate 1, NW LSD 6 13-48-28w3, has been spotted on acreage of Highwood-Sarcee Oils. Testing another potential extension a mile south and 2 miles east of Husky 4 producer. Withers-Lone Rock 1 has location in NE LSD 13, 6-47-26w3. Lloydminster Gas 6, LSD 13, 24-49-28w3, finished recently at 1,871 ft. and perforated at 1,820-26 ft., is officially reported to have initial production at the rate of 240 bbl., making it the largest oil producer yet drilled in Saskatchewan.

Saskatchewan regulations. — Announcement has been made by the Saskatchewan provincial government that the West Central area of the province, including the Lone Rock, Unity and Lloydminster sections, will not be open for geophysical or other reservation, but must be acquired under ordinary leasing provisions.

British Columbia.—In southeastern British Columbia, the Canadian Kootenay Oil Co. of Portland, Ore., drilling on the north fork of the Flathead River is in Madison limestone below 3,040 ft. with some oil saturation.

Steveville-Princess.—In the Steveville field, eastern Alberta, Princess-Brooks CPR 1, LSD 13, 17-19-13w4, finished at 3,415 ft. with drill-stem test indicating 1,800,000 cu. ft. gas, has been gun perforated to develop open flow of 23,000,000 cu. ft. The strike opens a new production area west of the Steveville field.

In the south extension of the Steveville field, South Princess Syndicate 2, LSD 4, 4-19-11w4, finished at 4,205 ft., with a small production from the top of the Madison, shows decreased water percentage, and is acidizing.

Jumping Pound.—In the Jumping Pound area, west of Calgary, Shell 16-14J, LSD 16, 14-25-5w5, offsetting the discovery well to the west, testing the Madison limestone at 10,335-480 ft., set plug at bottom to shut off water and is testing for gas.

Medicine Hat.—In the Medicine Hat gas field, southeastern Alberta, Medicine Hat 72, LSD 6, 7-13-4w4, finished as a producer at 1,112 ft. with around 1,000,000 cu. ft. gas. The Medicine Hat municipality has secured from the Alberta government gas

and oil rights on more than 43,000 acres for a period of 21 years, with power to renew. The holdings include 4,318 acres within the city limits and 39,406 acres adjacent.

ROCKY MOUNTAIN

Two Northwest New Mexico Discoveries Rumored

DENVER.—Northwestern New Mexico is very much in the spotlight due to reports of two discoveries in San Juan County, but one of these is still in the doubtful stage and the other lacks confirmation. The first of these is Paul B. English and Byrd-Frost, Inc. 1 Government, C NW SW 4-27n-10w, a test to the Dakota on the Kutz Canyon structure. It had the top of the Point Lookout sand in the Mesa Verde formation of upper Cretaceous age at approximately 4,402 ft. A drill-stem test at 4,412-54 ft., open 20 minutes, resulted in a recovery of 50 ft. of 72°-gravity oil, or distillate, and a strong flow of gas. Drilling then was resumed in that formation and 20 ft. of saturated sand was cored at 4,723-43 ft., followed by a drill-stem test, open 15 minutes, which yielded 50 ft. of oil and more gas. Coring then was resumed and at last reports it was at 4,762 ft., believed to be in the top of the Mancos shale, where the bit was twisted off and a fishing job is in progress. No further test of the shows is planned at this time, and the intentions are to continue on to the Dakota.

The other report concerns Southern Union Production Co. 17 Barker Creek, C NW NW 27-32n-14w, Barker Creek Dome, which is headed for the lower Pennsylvanian and is drilling at 9,002 ft. in the Paradox formation of lower Pennsylvanian age. Rumors are to the effect that a bleeding core was recovered in the top of the Pennsylvanian at around 7,500 ft. It lacks confirmation as the operation is a "tight" hole. This is the fourth well to the deeper horizon, and is the farthest out from the apex of the structure, being on the south side of the crest, which runs in a southwest-northeast trend. It is a mile to the southeast of the discovery which was completed early in 1945 for 60,000,000 cu. ft. of gas through perforations at 8,400-8,500 and 8,550-70 ft. No. 11, which is 1¼ miles north of the discovery, was completed last fall at 9,004 ft., total depth, for 41,000,000 cu. ft. per day. The third well, a mile southwest of the discovery, gaged 50,000,000 cu. ft. of gas at a total depth of 8,825 ft. When the fourth well was started, Southern Union purchased its own rig and is drilling the test on company account.

The interest in these two operations is due to a big lease play which has been under way for some time in the San Juan Basin, extending from northwestern New Mexico up into southwestern Colorado, and on into southeastern Utah. On the west side of the basin are several small oil pools, including Hogback, Table Mesa, and Rattlesnake, which produce high-gravity crude from the Dakota at from 800 to 1,350 ft. in depth. Farther to the northwest, in San Juan County, Utah, the Pennsylvanian is found within a few hundred feet of the surface, and a number of small producers have been completed over a long period of years. Running eastward, the formations lie at much greater depth. Kutz Canyon has gas production in the upper Mesa Verde at around 2,000 ft. Immediately to the northwest is Fulcher Basin, also developed for gas in the upper horizons. Continuing on this northwest trend next is the Ute Pasture structure on which the old Producers & Refiners Corp., and Midwest Refining, now Stanolind Oil & Gas Co., drilled 3 wells 25 years ago making 4,000,000, 37,000,000 and 70,000,000 cu. ft. of gas per day respectively. This gas is in the Dakota at around 2,500 ft. It is being marketed by Southern Union. Northwest of Ute Pasture is the Barker Creek structure which was developed for gas in the Dakota at around 2,500 ft., and which now has the three big gas wells in the Pennsylvanian. The structures being leased up continue on this same northwest trend through southwestern Colorado on into Utah. While leasing activity in this area has been going forward on a scale comparable to that in Colorado and Wyoming, it has received much less publicity.

Elk Springs Weber sand test.—Continental Oil Co. 1 Smith, SE SW 30-5n-98w, Elk Springs structure, Moffat County, Colorado, which topped the Weber sand at 6,087 ft., and was drilled to 6,111 ft., where it stopped to run casing, set the 7-in. at 6,090 ft., and is preparing to core into the sand. Drill-stem test at 6,087-6,111 ft., open 20 minutes, resulted in a recovery of 210 ft. of 39.5°-gravity oil and gas-cut mud and no water. It probably will be a week or two before the full importance of the discovery is apparent.

New operations.—Nineteen new operations were reported, of which 6 were in Colorado, 2 in Wyoming, 8 in Montana, 2 in northwest New Mexico, and 1 in Utah. The Colorado locations were all in the Rangely field. Wyoming had one in Little Buffalo Basin and one on Beaver Creek. The Montana locations included one each in Cedar Creek, Bowdoin and Rock Creek Bench, three in Cut Bank, and two in Kevin-Sunburst. The only wildcat was on Rock Creek Bench, in Fergus County, in Rock Creek Bench Oil Co. 1 Wesson, NE NE NW 36-14n-16e. The New Mexico locations were both in Fulcher Basin gas field. The Utah location is in Uintah County near the Duchesne County line, a wild-

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cat, in B. V. Bullock 1 Angus, C SW NE 36-1s-1e.

Completions. — Twenty-five wells were completed, of which 14 were oil wells for initial production of 2,400 bbl., 5 were gas wells, and 6 were dry holes. Colorado had 4 completions, all in the Rangely field, for 1,730 bbl. initial. Wyoming had 1 in Little Buffalo Basin for 193 bbl. Montana had 12 completions, of which 4 were oil wells for 352 bbl., 2 were gas wells, and 6 were dry holes. One of these, Texas Co. 2 Nick Laas, in Liberty County, was a gas discovery in the Devonian, one of the few tests of that formation in Montana. Northwest New Mexico had 8 completions, of which 5 were oil wells for 125 bbl. and 3 were gas wells. The initial production of the 5 oil wells, all of which are in the Hospah field, was not reported, but is estimated at 25 bbl. each.

MONTANA SUCCESSFUL WILDCAT

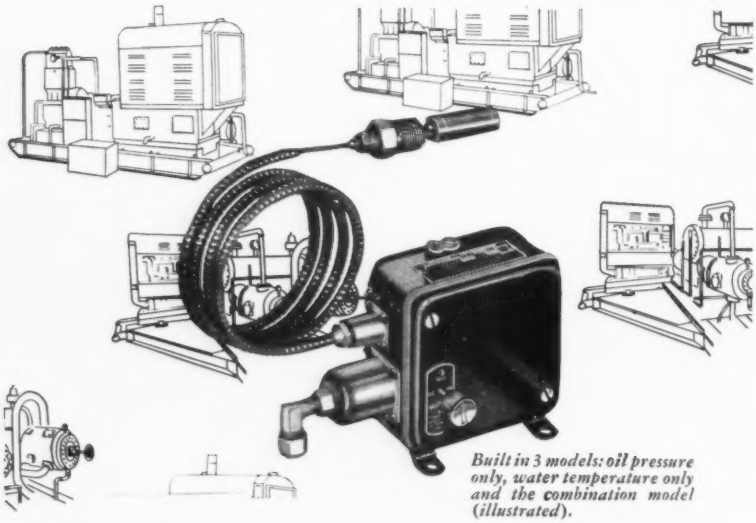
East Utopia, Liberty County: Texas Co. 2 Nick Laas, NW NE SW 14-33n-4e, TD 4,593 ft., 50 ft. in Cambrian. Completed in Jefferson member of Devonian formation for est. 20,000,000 cu. ft. of gas per day. El. 3,422 ft., top of Madison 2,327 ft., Devonian 3,321 ft., Jefferson dolomite 3,559 ft. Several horizons in Devonian tested through perforations.

MONTANA WILDCAT FAILURES

Daisy Dean, Meagher County: R. C. Tarrant 1 Holliday, C SW SW 35-9n-10e, TD 1,288 ft., top of Frontier 1,170 ft., dry.

Cut Bank, Glacier County: Needmore Oil Co. 1 Tuna, SW SW NE 5-36n-5w, TD 3,131 ft., top of Madison 3,063 ft., sulfur water, plugged.

Sun River, Cascade County: Lucky Seven Oil Co. 1 Sanborn, NE SW NW 23-21s-1w, TD 750 ft., dry.



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EASTERN TEXAS

Union Producing Co. Will Deepen Panola Wildcat

DALLAS.—Work was under way last week at Union Producing Co.'s old wildcat, the 11 L. Werner, Dan B. Lewis Survey, northeastern Panola County, to drill deeper. Some years ago this well was drilled to 3,650 ft. and abandoned. Operators have not announced the intended depth, but is was said to be 6,000 ft.

Five miles east of Gary, in Panola County, Hunt Oil Co. 1 Motley gaged 54,000,000 cu. ft. of gas daily through perforations in casing at 6,064-6,122 ft., after acidizing with 11,000 gal. Total depth is 6,500 ft.

In northern Houston County, 2 miles southwest of Weches, Magnolia Petroleum Co.'s wildcat, the 1-A Southern Pine, was reported dry at 7,407 ft. in the Georgetown lime, topped at 6,448 ft. Woodbine sand was said to have had water.

Also in Houston County, but in the southwestern section, about 4 miles southwest of Creek, John S. Ivy and W. T. Moran's 3 G. L. Muray & Sons, failed to find sub-Clarksville shows in cores at 7,795-7,815 ft., and was coring below 7,869 ft. looking for the Woodbine. With an elevation of 189 ft. and the base of Austin chalk at 7,790 ft., this well ran 100 ft. high on the company's 2 Moran, which based chalk at 7,876 ft., with an elevation of 166 ft.

In Leon County, Daniel Oil Co. 1 F. A. Cox, wildcat 4 miles southeast of Flynn, was coring below 7,188 ft., and still considered as looking good for sand section in the Woodbine. Cores from 7,160 ft. returned shale with thin sand streaks, and no shows. Last week this well held considerable promise when oil showed in the pits from 7,085 ft.

SOUTH LOUISIANA

Discovery Well Completed In Lake Pontchartrain

NEW ORLEANS.—Atlantic Refining Co. 1-A State-Lake Pontchartrain Lease 318, gas-condensate discovery for Big Point area, St. Tammany Parish, has been completed for a potential gage of 166 bbl. per day, and 6,255,000 cu. ft. gas per day through a 3/8-in. choke. Gas-condensate ratio was 37,800 to 1, tubing pressure 2,250 lb., gravity 51°, no water. Total depth is 11,052 ft., and production is through perforations at 7,180-88 ft.

Union Sulphur Co., Inc., 6 Schwing Lumber & Shingle Co., a workover in the Bayou Blue field of Iberville Parish, 67-9s-11e, has been completed in a new oil producing sand for the field. The well flowed a gage of 162 bbl. of 41°-gravity oil daily through a 7/64-in. choke with 1,350 lb. flowing pressure on the tubing. Gas-oil ratio of 488 to 1 was recorded. The new completion is through perforations at 6,902-08 ft. in sands showing oil at 6,902-12.

California Co. 4 E. P. Brady Unit 4, potential oil field discovery in the Alliance area of Plaquemines Parish, failed to flow after tubing was run. The well came in flowing oil and gas through a 1/8-in. choke with 1,800 lb. pressure while testing through the drill stem. When tubing was run, pressure dropped to zero. Well was shut in and built up to 4,000 lb. pressure, but when opened again, pressures dropped to zero a second time. Total depth of the hole is 14,187 ft., and 5 1/2-in. casing is cemented to the bottom. The well is perforated with 120 holes from 13,476-96 ft.

There were 19 new locations reported

this week, 4 being wildcats, 2 in Ascension and 1 each in Iberia and St. Martin parishes. The 12 completions included 10 oil wells and 2 dry holes. One new pool was opened in St. Tammany Parish, and one dry wildcat was completed in Terrebonne Parish. Plaquemines Parish received the greatest activity reporting three producers.

SOUTH LOUISIANA SUCCESSFUL WILDCATS

St. Tammany Parish: New gas-condensate pool Big Point area; The Atlantic Refining Co. 1-A State-Lake Pontchartrain Lease 318, in Lake Pontchartrain-9s-12e, TD 11,052 ft., top sand 7,157 ft., perf. 7,180-88 ft., PT 166 bbl. condensate per day and 6,255,000 cu. ft. gas per day through 3/8-in. choke, gas-condensate ratio 37,800 to 1, TP 2,250 lb., gravity 51°, no water.

SOUTH LOUISIANA WILDCAT FAILURE

Terrebonne Parish: Joe W. Brown 1 Lyons, in Duplantis area, 38-18s-18e, dry, TD 10,035 ft.

APPALACHIAN FIELD

Large Gas Well Completed In Allegheny County

PITTSBURGH. — In Patton Township, Allegheny County, southwestern Pennsylvania, Petroleum Drilling Corp. completed a large gas well on the A. L. Starr farm near Trafford, which had a final open flow when shut in of 5,500,000 cu. ft. of gas from the Sixth (Bayard) sand with the sand topped at 2,242 ft., gas 2,250 ft., and total depth 2,256 ft. It was reported the initial gage ranged up in the millions.

On Chestnut Ridge in Georges Township, Fayette County, the New Penn Development, William E. Snee et al test on the J. R. Smith farm, which was finally turned in the line for the week, has shown no decline in the amount feeding in the line nor on the back pressure on the well. Surveys are being made for additional locations.

In North Strabane Township, Washington County, the test of Charles E. Young on Rosa Topka farm continues to flow about 200 bl. a day from the Gordon sand and is the largest well in the new Young field.

New locations totaled 12 for the week and were located in Jefferson, Washington, and Westmoreland counties.

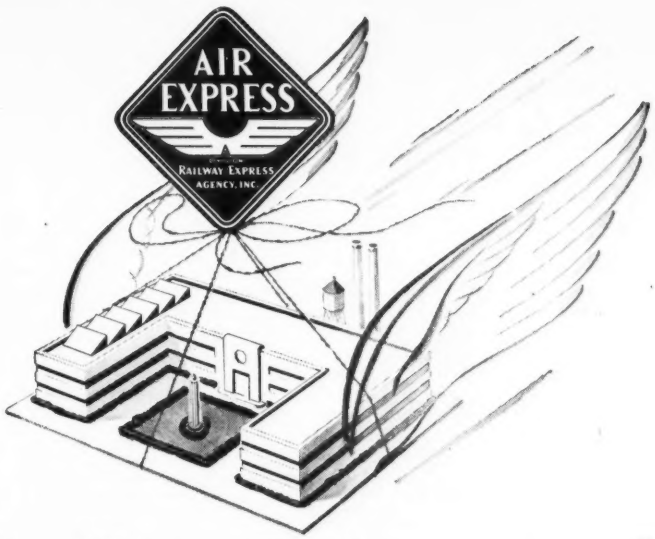
In the Walton district, Roane County, West Virginia, Johns Gas Co. topped the Oriskany sand at 5,455 ft. in the wildcat on Isaac L. Summers farm, and at 5,460 ft. water broke in which is being bailed. From a surface location of 855 ft., the Oriskany was placed at minus 4,600 ft.

In Ripley district, Jackson County, United Carbon Co. completed 1,398 Ermina Puckett with a final open flow of 9,941,000 cu. ft. gas, natural, from the Oriskany sand. The surface elevation is 865 ft., Corniferous lime 4,935 ft., Oriskany 5,038 ft. and total depth 5,059 ft.

In Big Sandy district, Kanawha County, Falling Rock Producing Co. completed the second test on Fred J. Thabet farm in the Oriskany good for 4,176,000 cu. ft. gas, natural, with a surface elevation of 1,135 ft., Corniferous lime 5,399 ft., Oriskany 5,530 ft., and total depth 5,553 ft. In Elk district, Columbian Carbon Co. topped the Corniferous lime at 4,927 ft. in the 863 Harriet Morton, surface elevation 721 ft.

In McKim district, Pleasants County, Dinsmoor & Co. completed 29 G. C. Roby for 30 bbl. oil and 10,000 cu. ft. gas from the Injun sand, total depth 1,685 ft.

New locations totaled 29 and were located in Barbour, Braxton, Calhoun, Fayette, Harrison, Kanawha, Lincoln, Logan, Raleigh, Ritchie, Roane, Tyler, Upshur, Wayne, Wetzel, Wirt, Wood, and Wyoming counties.



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MICHIGAN

High Rate of Failures Continues in Michigan

SAGINAW.—The discouraging succession of dry holes in Michigan oil and gas explorations continued in the past week, 10 of the 14 completions being failures. Two oil wells were inconsequential and the two gas producers were about average while six of the dry holes were wildcats.

Sixteen new locations were announced. Six are in Allegan County, two each in Arenac and Kent, one each in Bay, Gratiot, Ionia, Oceana, Van Buren and Isabella.

An auction of state-owned wildcat lands has been set by the conservation department for November 1. Most of the 31,800 acres of oil and gas leases on the block is in Lake, Oceana and Ogemaw counties; small tracts also being listed in Allegan, Arenac, Bay, Gladwin, Mecosta, Newaygo, Saginaw, Roscommon and Wexford.

MICHIGAN WILDCAT FAILURES

Allegan County, Allegan Township: Russell W. Cooper 1 Clyde Mead, SE SW NW 3-2n-13w; dry in Traverse, TD 1,495 ft.

Arenac County, Mason Township: Basin Oil Co. 1 Nelson Lehman, NW SE NE 35-20n-5e, dry in Dundee, TD 3,068 ft.

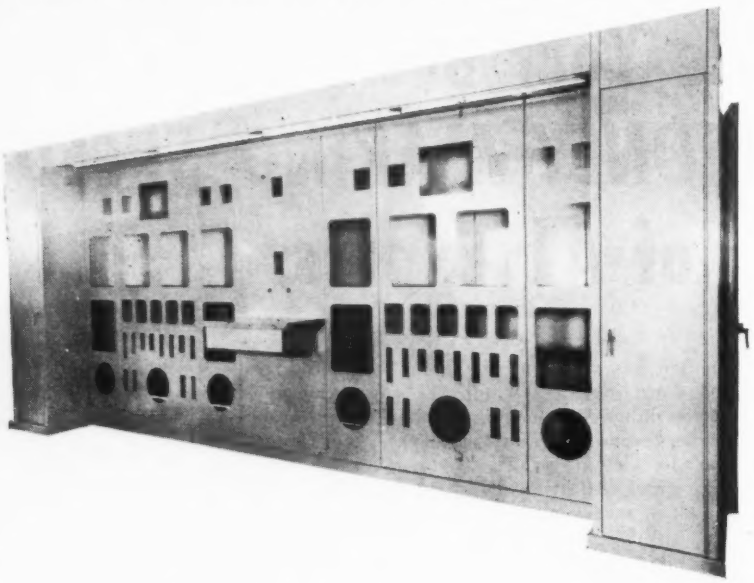
Clinton County, Lebanon Township: Smith Petroleum Co. 1 M. & N. Hockstra, NW NE SW 28-8n-4w, dry in Dundee, TD 3,010 ft.

Gratiot County, North Star Township: R. W. Matlock-A. E. Williams 1 G. F. Spidel, NE SW SW 2-10n-2w, dry, TD 888 ft.

Saginaw County, Albee Township: Fred W. Craft 1 A. & A. E. Williams, N½ NW SE 29-10n-4e, dry in Dundee, TD 2,925 ft.

Van Buren County, Waverly Township: Harry Stroud 1 Charles A. Biermann, NW SW SW 3-2s-14w, dry in Traverse, TD 1,260 ft.

Instrument Control Panels



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CALIFORNIA

Testing Delays Prevent Completion of Wildcats

LOS ANGELES.—Delays which inevitably accompany testing and completion of exploratory wells prevented California operators this week from obtaining the final answer at numerous significant locations. Numerous wildcat operations are in process of testing, holding interest at high level, pending final results.

Probably the most interesting exploratory operation in the Los Angeles basin is the deep wildcat at Potrero, Basin Oil Co. 1 Standard Brick, 28-2s-14w. Operators resumed coring this week after converting boilers from natural gas to fuel oil and were last reported progressing at 10,348 ft. The wildcat is credited with logging numerous sand zones in Miocene between 9,300 and 9,900 ft.

Deep tests in the San Joaquin Valley also continued drilling and coring and operators persist in their refusal to release detailed information on other than depth progress.

Belridge Oil Co. 62-W-33, deep test in the South Belridge field, 33-28s-21e, was temporarily delayed at 13,950 ft. by a fishing job.

Richfield Oil Corp. has completed two additional core holes in 30-28s-21e and is nearing completion depth on another in Section 19. Meanwhile, the company's projected deep operation, 1 Berry in Section 30, remains idle at 4,485 ft., presumably awaiting determination and analysis of corehole data.

California's deepest wildcat operation, Pacific Western Oil Corp. 1 National Royalties, 5-26s-22e, in the Miramonte area of Kern County, east of the Lost Hills field, is drilling at 15,453 ft. Slightly more than 300 ft. of additional hole were made during the week. Four new locations were authorized last week by Standard Oil Co. of California at Lost Hills, three of which fall in 29-26s-21e, giving that field the most concentrated cluster of new locations for a proven San Joaquin area during the 7-day period.

At Coles Levee, Richfield 21-33 C.L.-A., 33-30s-25e, continues making hole at 12,050 ft., seeking production below the regular Stevens pay, and Shell Oil Co., Inc., 53-30 KCL-A, 30-30s-26e, another test for pay below the Stevens in the Ten Section field, is drilling at 9,050 ft.

Three wildcat operations seeking gas production in Solano County were reported at various stages. Shell Oil Co., Inc., 1 Dozier-Pressley, 16-3n-2e, is drilling at 4,608 ft., in the Rio Vista area. The company's 1 Wagenet, 24-4n-1w, in the Kirby Hills district, is preparing to spud. National Investors Fund, Inc., 1 Burke & Donohoe, 12-4n-1w, Potrero Hills area, is drilling at 2,165 ft.

Possible production from the conglomerate was indicated during the week at F. E. Fairfield 1 Lemon Co., 23-3n-21w, in Ventura County. The well started flowing by heads to the pit after perforated liner was set at 3,084 ft. Perforations were located at 2,700 to 3,074 ft. and packer was set at 2,660 ft. Conglomerate was topped at 2,690 ft., and the hole is bottomed at 3,086 ft.

The pace of drilling activity in California was slightly accelerated this week. Operators authorized 42 new locations with 7 at Wilmington representing the largest concentration of new activity. Cymric field, Kern County, received six new locations to take second place for the week.

CALIFORNIA SUCCESSFUL WILDCAT

Ventura County, Del Valle area: Superior

Oil Co. and British-American Oil Producing Co. 3-A Black, 13-4n-18w, pump 130 bbl. per day, 25.3°-gravity, TD 2,371 ft.

CALIFORNIA UNSUCCESSFUL WILDCATS

Los Angeles County, East Los Angeles area: Richfield Oil Corp. 2 U. P. Unit, 8-2s-12w, rec. salt water on formation test 8,828-61 ft., dry, TD 8,861 ft.

San Joaquin County, Victoria Island area: Amerada Petroleum Corp. 1 Borden, 33-1n-4e, dry, TD 6,000 ft.

Kern County, Temblor Ranch area: Gannon, Gallon & Anslin 69-J-3 Temblor, 36-29s-20e, dry, TD 1,000 ft.

Second Round Mountain area: M. R. & M. Syndicate 3 Tarabino, 5-29s-29e, top lower Vedder, 2,953 ft., dry, TD 2,980 ft.

Kern Bluff area: Standard Oil Co. of California 72-29 Fee, 29-29s-29e, top Olcese, 3,005 ft.; first Jewett, 4,538; hard basement complex, 5,520; dry, TD 5,545 ft.

Ventura County, Simi area: Richfield B-1 Tapo, 29-3n-18w, dry, TD 1,921 ft.

Monterey County, San Lucas area: The Texas Co. 1 Currel, 4-21s-8e, dry, TD 3,281 ft.

ILLINOIS

Wabash Wildcat Flows Oil on Drill-Stem Test

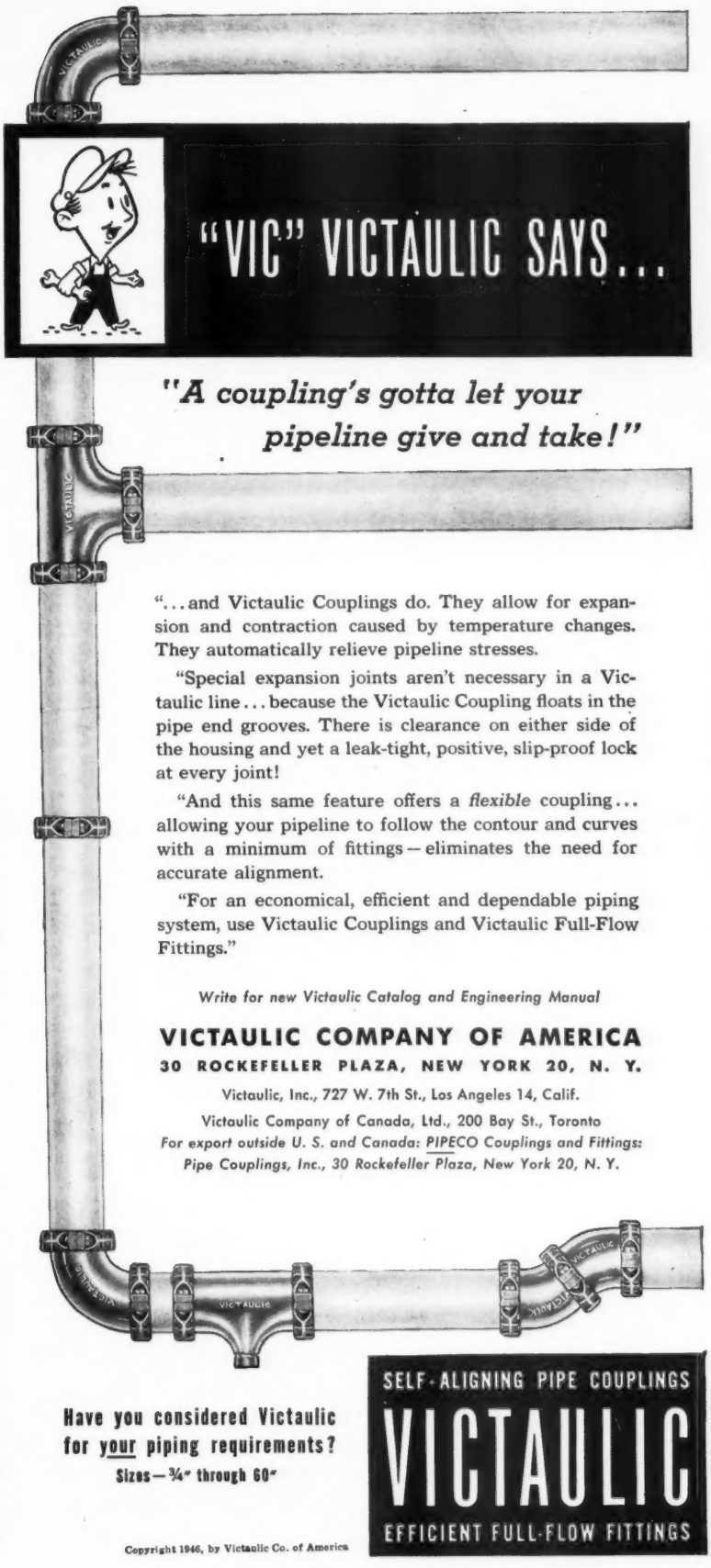
MATTOON.—Another new oil pool apparently has been found about 1½ miles west of the Lancaster field in Wabash County. The Sam Malis et al 1 W. Fite, N½ NE NW 7-1n-13w, flowed clean oil in 18 minutes on a drill-stem test of the McClosky lime at 2,800-20 ft. The McClosky was topped at 2,814 ft. and tools were still in that formation at the total depth of 2,820 ft. The zone was said to contain excellent oil saturation.

The McCummings Oil Co. showed promise of extending production in the Flora pool about ½ mile to the southeast during the past week with their 1 Eppery, NE SE NW 23-3n-6e. Saturation was encountered in the McClosky at 2,994-3,000 ft., total depth, and a 1-hour drill-stem test resulted in the recovery of 1,320 ft. of gas, 150 ft. of clean oil, and 30 ft. of mud heavily cut with oil. Operators are now rigging up cable tools to start testing.

C. E. Brehm is installing pump to test the Aux Vases sand at his 1 Clyde Callicotte, SE SE NW 10-6s-10e, White County pool opener just south of the West Maunie pool. According to latest reports the well swabbed at the rate of 200 bbl. of oil and 6 bbl. of salt water in 20 hours from the Aux Vases at 2,950-60 ft., total depth.

The number of oil well completions in Illinois was the highest in September for any month since November 1941, according to the monthly oil and gas drilling report issued by the Illinois State Geological Survey. Well completions, which have been steadily increasing throughout the year, reached a peak of 276 in September. Oil production, which had been decreasing annually since peak production in 1940, shows a similar upward trend, with about 700,000 bbl. more of oil produced in the first 9 months of 1946 than for the corresponding period in 1945.

The increased drilling resulted in the discovery of 4 new pools, 12 extensions to pools, and 4 new pays in pools during September. Wabash County led with three of the four new pools: Lancaster South, Friendsville Central, and Browns East. A fourth new producing area was opened up in the county with three wells completed as a continuation into Illinois of the New Harmony South pool of Indiana. The fourth new pool was Ridgway in Gallatin County.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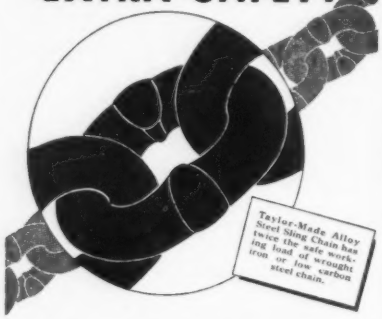

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ILLINOIS SUCCESSFUL WILDCATS

Clay County: Eason Oil 1 N. E. Gibson, SW NW SW 35-5n-7e, pumped 30 bbl. oil, 30 qt. shot 2,808-15 ft., Aux Vases sand 2,803-15 ft., TD 2,823 ft.

Gallatin County: Joe Reznik et al 1 Valter, SE SE NE 3-9s-9e, pumped 8 bbl. oil, Aux Vases sand 2,726-34 ft., TD 2,739 ft.

Wabash County: Hayes & Wolf Oil Co. 1 Smith, NW NW SW 17-1s-13w, pumped 26 bbl. oil, 160 qt. shot 2,611-75 ft., Benoist sand 2,626-53 ft., TD 2,860 ft., PB 2,675 ft.

ILLINOIS WILDCAT FAILURES

Bond County: Paul Doran 1 Manley, NE NW SE 10-4n-1w, dry at 1,401 ft., Tar Springs 1,059 ft., Glen Dean 1,100 ft., Benoist 1,389 ft.

E. A. Obering 1 Guaedinger, SW SW NE 33-4n-4w, dry at 2,179 ft., Ste. Genevieve 1,041 ft., Devonian 2,139 ft.

Clay County: A. J. Hammer 1 McCulley, NE NE NW 13-4n-5e, dry at 2,737 ft., Glen Dean 2,113 ft., Cypress sand 2,311 ft., Aux Vases sand 2,550 ft., Ste. Genevieve 2,580 ft.

Gilliam & Aspin 1 Bible, NE NE SE 35-4n-6e, dry at 3,030 ft., Menard 2,230 ft., Glen Dean 2,440 ft., Cypress sand 2,621 ft., Benoist 2,794 ft., Aux Vases sand 2,892 ft., Fredonia 2,974 ft., McClosky 2,993 ft.

Coles County: Mula Reibey 1 I. F. Rennels, NW NW NW 1-11n-10e, dry at 930 ft., Ste. Genevieve 930 ft.

Edwards County: Phillips Petroleum Co. 1 Matina, SW NE NW 18-1s-14w, dry at 3,239 ft., Glen Dean 2,498 ft., Cypress sand 2,764 ft., Benoist 2,905 ft., Ste. Genevieve 3,085 ft., Levias 3,096 ft., McClosky 3,178 ft.

Sam Malis 1 Nona Hoezle, SE SW NW 22-1n-10e, dry at 3,307 ft., Tar Springs 2,579 ft., Glen Dean 2,664 ft., Cypress sand 2,888 ft., Benoist sand 3,133 ft., Aux Vases sand 3,208 ft., Ste. Genevieve 3,252 ft., McClosky 3,282 ft.

Effingham County: National Associated Petroleum Co. 1 Enderbrock, SW SW NE 28-7n-7e, dry at 2,887 ft., Glen Dean 2,269 ft., Ste. Genevieve 2,710 ft., Fredonia 2,742 ft., McClosky 2,761 ft.

Edgar County: Wm. P. Ford 1 S. Comstock, NW NW 22-13n-14w, dry at 1,324 ft., Karper sand 1,031 ft., Devonian 1,315 ft.

Hamilton County: Collins Bros. 1 R. Davis, SW NE SW 13-4s-7e, dry at 3,515 ft., Waltersburg 2,607 ft., Tar Springs 2,734 ft., Glen Dean 2,776 ft., Cypress sand 3,090 ft., Benoist 3,283 ft., Aux Vases sand 3,342 ft., Ste. Genevieve 3,412 ft., McClosky 3,496 ft.

Sangamon County: E. White 1 Prior, SW SW SE 21-16n-3w, dry at 918 ft.

Wabash County: George Engle 1 Guiswite, SW SW SE 23-1n-13w, dry at 2,633 ft., Ste. Genevieve 2,565 ft.

Wayne County: Ohio 1 J. N. Ehlers, NE SE NE 5-2n-7e, dry at 3,160 ft., Glen Dean 2,533 ft., Cypress sand 2,706 ft., Aux Vases sand 2,976 ft., Ste. Genevieve 3,029 ft., McClosky 3,067 ft.

OHIO, KENTUCKY

West Extension For North La Grange Pool Completed

COLUMBUS.—A mile west extension to the North La Grange pool was completed by Harmon et al on the Johnson-Chess Consolidation, Lot 36, La Grange Township, Lorain County. Clinton sand at 2,392-97 ft. gaged 1,521,000 cu. ft. of gas, natural.

Southwest of Zanesville, Wasson Co. drilled in its 1 Harry Osborne, Section 3, Wayne Township, Muskingum County. Clinton, topped at 3,899 ft., gaged 300,000 cu. ft. at 3,906 ft., and increased to 1,554,000 cu. ft. at 3,919 ft.

A 2,260,000-cu. ft. well was completed in the Big Prairie pool in Holmes County by the Ohio Fuel on John Thompson, Section 6, Ripley Township. Clinton, at 3,125-35 ft., rocked up to 1,070 lb. pressure.

An important ¼-mile extension to the Hemlock Grove pool was completed by Wallace Brothers on Waid Bing, Section 1, Bedford Township. Berea sand, 1,575-95 ft., flowed 50 bbl. in 20 hours after shot.

Eight new locations were reported in the Canton pool which continues at a fast pace with 60 or more strings running. Cambridge and Stewart fields each reported six locations, while Lancaster and Ashland reported four each, Brush Creek two, and Mount Vernon one. Twenty-six completions were reported.

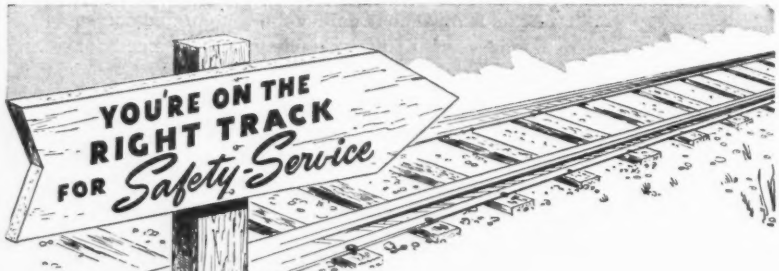
WESTERN KENTUCKY

OWENSBORO.—In Hopkins County, about 6 miles northeast of the village of Hanson, H. H. Weinert is preparing to test the 1 J. R. Breeden, 23-L-26. Pipe has been set at 1,700 ft. for a test of the Pennsylvanian sand at 1,530-50 ft., which is estimated to be capable of producing about 15,000,000 cu. ft. of gas daily. The 1 Breeden is approximately 7 miles from nearest oil production.

Completions in the Western Kentucky area showed a slight increase during the past week with three oil wells, two gas wells and one dry hole reported. No exploratory tests were finaled. New operations announced during the week totaled three, and included one wildcat each in Henderson and Union counties, and a field development well in Daviess County.

INDIANA

EVANSVILLE.—A new oil producing area is being opened in Posey County about 1½ miles northeast of production in the New Harmony South pool. Here the Calvert & Willis 1 Fred Wiley, SW SW NE 18-5s-13w,



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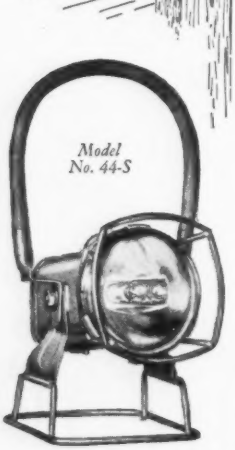

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is being put on pump after perforating pipe with 48 shots opposite the McClosky lime at 2,970-77 ft., total depth 3,023 ft. During the first 15 hours after perforating, the well swabbed 210 bbl. of fluid, of which 92 per cent was oil and 8 per cent was water. The well has not yet been acidized.

Indiana completions during the past week totaled seven, including five oil wells and two dry holes, one of the latter being a wildcat. New operations announced during the week totaled eight, of which four were located in Posey County, and one each in Gibson, Knox, Pike, and Spencer counties. The new Gibson County test, W. R. White et al 1 Edward Martin, NW SW NW 17-4s-11w, is a wildcat scheduled to go to the McClosky.

INDIANA WILDCAT FAILURE

Vanderburgh County: George & Wrather 1 Mahler, SW SW SE 6-5s-11w, elev. 535 ft., dry at 2,755 ft. in St. Louis, Tar springs 1,983 ft., Glen Dean 2,047 ft., Cypress sand 2,324 ft., Benoist sand 2,481 ft., Aux Vases sand 2,611-16 ft.

KANSAS

Location Staked for New Meade County Test

STANOLIND OIL & GAS CO. has staked location for a new oil test in Meade County at the 1 Rickers, SW SW NE 27-32-29w, approximately 8 miles southwest of the town of Meade. The 1 Rickers is scheduled to go to the Mississippi lime. It is located about 14 miles northeast of Stanolind's 88,000,000-cu. ft. gas strike, 1 Adams, SW SW SW 8-35-30w, in the same county.

Meanwhile, Stanolind 2 Adams, NE NE SW 9-35-30w, the first of several tests planned for the Adams Ranch, cored from 5,840-47 ft. and recovered 7 ft. of shale with thin lime streaks containing a slight show of oil. A 2-hour drill-stem test at 5,810-62 ft. resulted in the recovery of only 57 ft. of mud. Total depth is now 5,862 ft. This test is approximately 1½ miles northeast of the 1 Adams, which was completed last year.

Stanolind, who is very active in exploring the southern part of the state, is also drilling a wildcat in Seward County, 2 miles west of Liberal. It is the 1 Feathers, SW SW NE 15-35-33w, about 20 miles due west of the Adams Ranch play, and is slated as an 8,000-ft. Arbuckle lime test. It is now drilling below 4,537 ft.

In Rush County, H. H. & B. Drilling Co. have completed their discovery, the 1 Hilgers, NE NE NE 13-9-19w, for a potential of 2,735 bbl. of oil daily from the Arbuckle lime at 3,479-84 ft. The 1 Hilgers is a south extension of the Barry pool.

Potential has also been assigned to the Magnolia 1 Christianson, SE SE SW 28-19-16w, another Rush County discovery more than 2 miles west of the Ryan pool. In a preliminary test, this well established a potential of 122 bbl. of oil daily from the Lansing lime through perforations at 3,740-49 ft. The Arbuckle was dry.

KANSAS SUCCESSFUL WILDCATS

Marion County: Anderson-Pritchard Oil 1 Warkentin Unit, SE SE NW 27-19s-1e, flowed 11 bbl. of 36°-gravity oil per day from Mississippi lime at 2,808-42 ft., Topeka 1,668 ft., Heebner 2,006 ft., Lansing-Kansas City 2,164 ft., TD 2,842 ft.

Pratt County: Bridgeport Oil 1 Pride "C," NE NE NE 24-29s-13w, flowed 164 bbl. of 33.1°-gravity oil per day from Viola at 4,483 ft., Lansing-Kansas City 3,890 ft., Mississippi lime 4,344 ft., TD 4,490 ft.

KANSAS WILDCAT FAILURES

Pratt County: Parks & Lindas 1 Baker, C W/2 NW SW 34-27s-12w, dry, TD 4,502 ft., Lansing-Kansas City 3,655 ft., Basal

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Kansas City 4,102 ft., Mississippi lime 4,135 ft., Kinderhook 4,187 ft., Viola 4,280 ft., Simpson 4,369 ft., Arbuckle 4,480 ft.

Rooks County: C. E. Ash 1 O. F. Krueger "A," SW SW SW 28-10s-16w, dry, TD 3,711 ft., anhydrite 1,195 ft., Lansing-Kansas City 3,193 ft., conglomerate 3,494 ft., Simpson dolomite 3,623 ft., Simpson shale 3,632 ft., Sampson sand 3,645 ft., Arbuckle 3,657 ft.

MISSISSIPPI

Adams County Wildcat Drilling Ahead

JACKSON.—In Adams County, Ohio Oil Co.'s wildcat was being watched for developments but tops were unavailable last week. Current reports on the 1 Armstrong, in 12-5n-3w, show it drilling ahead at 10,345 ft.

In Leake County, Caraway & Travis' wildcat, the 1 Kelly, 27-10n-8e, recovered 3 ft. of porous white sand, but no shows, at 5,100-10 ft. It is drilling deeper.

New locations in Mississippi last week included Cook Drilling Co. 1 Wilson, 4-6n-8e, Lincoln County; and Stanolind Oil & Gas Co.'s stratigraphic test in Sharkey County, which will be the 1 School Land in 16-11n-5w.

MISSISSIPPI WILDCAT FAILURES

Grenada County: J. R. Lockhart 1 Guy Fite, S/2 NE NW NW 25-22n-6e, dry, TD 4,545 ft., Midway 730 ft., conglomerate 1,372 ft., Eutaw 2,230 ft., Tuscaloosa 2,477 ft., Basal Tuscaloosa gravel 2,728 ft., Pennsylvanian 3,620 ft.

Smith County: Pan American Producing 1 U. S. A., C SE NE 14-3n-7e, dry, TD 7,656 ft., Midway 4,068 ft., conglomerate 4,682 ft., Eutaw 5,868 ft., Tuscaloosa 6,260 ft., Marine Tuscaloosa 6,995 ft., Massive sand 7,438 ft.

FLORIDA WILDCAT FAILURE

Franklin County: Pure Oil Co. 3 Gex-Lewin, C/L W/2 NW NE 3-8s-6w, dry, TD 5,060 ft., no tops reported.

LA.-ARK.

Delhi Field Extended Into Madison Parish

SHREVEPORT. — The rapidly expanding Delhi field, whose main body is in Franklin Parish, last week had a possible northeast extension at Murphy and Sun Oil Co.'s 1 O'Neal Wilburn, in 17-17n-10e. On last report operators had set producing string at 3,369 ft. and were waiting on cement. In the same area, but about 4 miles east, the same operators' 1 Ashley Plantation, 13-17n-10e, was drilling below 3,639 ft. Atlas Oil & Refining Co.'s 1 Yerger in 5-16n-14e, about 4 miles south of the Wilburn test, was reported drilling below 6,164 ft.

In Sabine Parish, the north side of the west end of Zwolle had a possible extension at Preston P. Reynolds 1 Sabine Lumber Co. The well, in 31-7n-13w, was waiting on orders before deepening after swabbing oil at 2,508 ft.

In Arkansas, entry of The Carter Oil Co. into the play at Gum Creek, 6 miles east of Stephens, increased the field's chances of becoming a major field, according to some operators' opinions. Rigs in operation in the field include Carter's 1 Dorothy Crowley, SW NE NE 27-15-18, rigging up; Spartan Drilling Co. 2 Halton Estate, NW NE SE 28-15-18, waiting on cable tools to

complete, with casing set at 2,400 ft.; earlier in the week Spartan's 1-B Thompson, SW NW NW 26-15-18, reported a flow of 100 bbl. daily from the Blossom sand at 2,360 ft. A number of other rigs were said to be getting under way.

A possible west extension well to Blossom sand production was in prospect at T. W. Lee's 1 Grayson, NE NE 35-14-20, Nevada County. Casing was set at 2,100 ft. in the sand and production tests will be made next week.

NORTH LOUISIANA WILDCAT FAILURES

Caddo Parish: H. M. Sneed 1 W. L. Simmons, CL E/2 SE SW 15-16n-14w, dry, TD 1,211 ft., Arkadelphia 925 ft.

Winn Parish: H. L. Hunt F-133 Goodpine, SW NE NE NE 25-12n-5w, dry, TD 8,678 ft., anhydrite stringer 7,010 ft., Massive anhydrite 7,125 ft., Pettit 8,405 ft.

OKLAHOMA

Cotton County Play Continues to Broaden

THE active Cotton County play continued to broaden during the past week with no let up predictable in the near future. Wildcats are being staked at an average rate of greater than one a day, and it is estimated that about 30 wildcats are being planned at this time.

Most recent discovery in the area is the extension of the old Keys-Walters pool in the northern part of the county. The Erle P. Halliburton 1 Tilley, SW SW NE 23-1s-10w, about ½ mile northeast of the gas well discovery of the field—drilled in 1917—had the Zipsie sand at 2,328-45 ft. and recovered 420 ft. of oil on a drill-stem test. After drilling in it is pumping an estimated 75 bbl. of oil daily.

Akin and Dimock 1 Brown, SW SW 6-5s-12w, prospective discovery southwest of Randlett and 2 miles north of the Red River, remained shut down during the past week with casing set at 1,560 ft. on saturation encountered at 1,560-71 ft., total depth. Operators postponed drilling the plug until after a lease sale at Anadarko on October 16, during which the Kiowa Indian Agency will offer 128 tracts in Cotton County, 57 of them within 6 miles of the 1 Brown.

Cities Service Oil Co. et al have succeeded in setting plug at 11,200 ft. in the 1-B Lawson, NE SW 22-5n-4w, in the North Lindsay field of McClain County. Plug was set to enable the crew to go back into the well to retest showings encountered in the Bromide zone. The well was drilled to a total depth of 12,398 ft. in the Arbuckle, which was dry.

Oklahoma Natural Gas Co. last week perforated pipe with five shots at 8,950 ft. in the Pennsylvanian zone at their eastern Dewey County wildcat, the 1 Oakwood Unit, 6-17n-14w. Circulation was lost following the perforating and operators recemented and will run a temperature test. Plugged back depth of the well is 9,560 ft.

Oklahoma's exploratory campaign, which has been at a record level during recent months, gained additional momentum during the past week as operators announced 18 new wildcat tests. Cotton County led with 11 of the new tests, while Seminole County had 2, and Carter, Garfield, Garvin, Kay, and Lincoln counties had 1 each.

OKLAHOMA SUCCESSFUL WILDCATS

Jefferson County: Burns Oil 1 Marshall, discovery well, C NW SE 20-6s-7e, pumped 115 bbl. of 36°-gravity oil per day from second Bromide at 3,256 ft., limy shale 210 ft. with a slight show of oil, Woodford 1,530 ft., Hunton 1,914-21 ft., Sylvan 1,921 ft., Viola 2,250 ft., TD 3,475 ft.

Stephens County: Phillips 1 Jemison, new pay zone, SE NW NE 31-1n-5w, pumped 21 bbl. of 18°-gravity oil per day from sand at 770-96 ft.; sand 1,804-16 ft., 1,996-2,014 ft. and 4,027-62 ft., TD 4,057 ft.

Texas County: Skelly Oil Co. 1 Rose George, SW SW NE 9-2n-17ecm, produced 5,612 cu. ft. of gas per day from Herrington at 2,666 ft., top Krider 2,707 ft., Winfield 2,804 ft., TD 2,814 ft.

OKLAHOMA WILDCAT FAILURES

Choctaw County: H. F. Paul et al 1 Dell Norwood, NW SW NW 17-5s-16e, dry, TD 1,034 ft., Atoka shale 700 ft., sand and shale 1,000 ft.

Cotton County: L. H. Choate 1 Scruggs, NW NW NW SE 16-4s-11w, dry TD 1,854 ft., no tops reported.

Harper County: Continental, Allied et al 1 Howard, SW SW SE 15-27n-21w, dry, TD 7,782 ft., Herrington 2,425 ft., Mississippi lime 5,813 ft., sand 5,959-72 ft., Viola 7,190 ft., Simpson 7,518 ft., Arbuckle 7,692 ft.

Stephens County: Amerada 2 Paschall, NW SE SE 29-1s-5w, dry, TD 7,329 ft., Hoxbar 1,460 ft., Deese 2,960 ft., sand 3,425 ft., 3,532-40 ft., with a stain of oil, 3,894 ft., 3,920-24 ft. with a good stain of oil and 3,980-3 ft. with a stain and odor of oil.

Pump Ceilings Raised

WASHINGTON.—Manufacturers of gasoline dispensing pumps last week were authorized by the Office of Price Administration to increase existing ceiling prices about 5 per cent, raising the total advance since October 1941 to 21 per cent.

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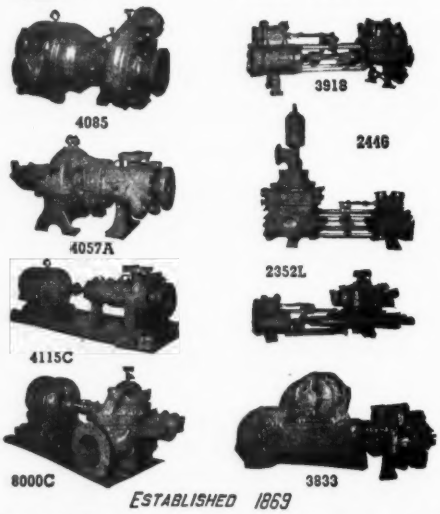

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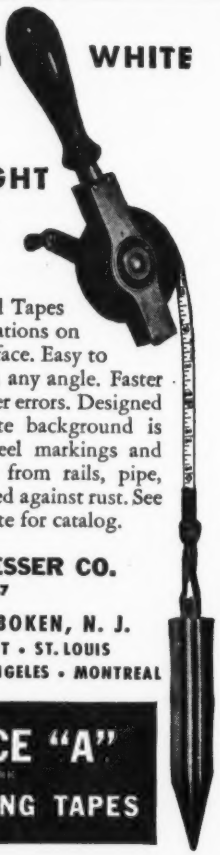

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CALENDAR

October

American Institute of Mining and Metallurgical Engineers, Petroleum Division, annual meeting, Ambassador Hotel, Los Angeles, October 24-25.

American Association of Petroleum Geologists, midyear meeting, Buena Vista Hotel, Biloxi, Miss., October 24-25.

Independent Petroleum Association of America, annual meeting, Fort Worth, October 28-30.

Midwest Gas Association and Iowa State College Gas School and Conference, Ames, Iowa, October 28-30.

November

Los Angeles Nomads, Fall Festival, Mayfair Hotel, Los Angeles, November 2.

Mississippi-Alabama division, Mid-Continent Oil and Gas Association, second annual membership meeting, Edwards Hotel, Jackson, Miss., November 4.

Society of Automotive Engineers, national fuels and lubricants meeting, Mayo Hotel, Tulsa, November 7-8.

Houston Nomads, Old College Inn, Houston, November 11.

A.P.I. annual meeting, Stevens Hotel, Chicago, November 11-14.

Los Angeles Nomads, Mayfair Hotel, November 13.

American Welding Society, annual meeting, Atlantic City, N. J., November 18-22.

American Society for Metals, annual meeting, and National Metal Exposition, Atlantic City, N. J., November 18-22.

American Institute of Mining and Metallurgical Engineers, iron and steel division, and institute of metals division, annual fall meeting, Atlantic City, N. J., November 18-22.

Mid-Southeastern Gas Association, Raleigh, N. C., November 21-22.

Rocky Mountain Oil and Gas Association, annual meeting, Shirley-Savoy Hotel, Denver, November 21-23.

Independent Natural Gas Association of America, annual meeting, Blackstone Hotel, Fort Worth, November 22.

December

American Society of Mechanical Engineers, New York, December 2-6.

New Mexico Oil and Gas Association, annual membership meeting, Artesia, N. M., December 4.

Houston Nomads, Old College Inn, Houston, December 9.

Interstate Oil Compact Commission, winter quarterly meeting, Dallas, December 9-11.

Oil Dealers Association of Arkansas, Hotel Marion, Little Rock, December 10.

Los Angeles Nomads, Mayfair Hotel, December 11.

Mid-Continent Oil and Gas Association, annual ad valorem tax forum, Plaza Hotel, San Antonio, Tex., December 16-18.

Canadian to Keep Crude Subsidy, Official Says

CALGARY, Alta.—Donald Gordon, chairman of the wartime Prices and Trade Board, stated here recently that there is no likelihood of an early removal of part or all of the subsidy on crude oil imported into Canada.

The price of U. S. crude at Canadian refineries is kept to the Canadian crude-price ceiling by the payment of a substantial subsidy by the government. Alberta oil operators feel that removal or reduction of the subsidy would increase the price of Alberta crude.

New Mobile Airport-Service Unit Developed for Shell

HOUSTON.—A new-type mobile airport-service unit, called the Beaver, developed for the Shell Oil Co., Inc., to refuel light and medium-size aircraft, is now in operation. It will replace stationary pumping units and large trucks wherever practicable in servicing private aircraft and is expected to increase servicing efficiency considerably.

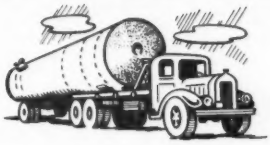
The Beaver is equipped with a 200-gal. fuel tank mounted on a Crosley chassis, with a 4-cylinder, 28-hp. Crosley Cobra engine. It is designed to travel over any type of surface where an airplane can land safely and can handle approximately 20 refueling jobs without refilling, since the average small plane seldom takes more than 10 gal. at a time.

The Beaver carries its hose in the forward compartment and lubricating oil and accessories in the rear. Additional equipment includes a fuel pump operated by a power takeoff from the engine, with a delivery capacity of approximately 25 gal. per minute, an air eliminator, and a recording meter. The Beaver was designed by Engineering Research Associates, Inc., St. Paul, Minn.

Shell Oil Co., Inc., has placed in operation a new mobile airport service unit which the company's aviation department termed a major advance in the field of light-plane refueling. Called the Beaver, it will service light and medium-size aircraft where they land without taxiing or waiting

Oil Field and Specialized Hauling

PIPE STRINGING



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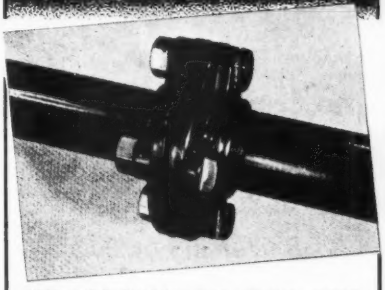

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For oil field, locomotive type and marine boilers. Water shows black — steam shows white; the water level is unmistakable. U-Bolt construction is strongest and simplest to service. Glass replaced by simply removing nuts on face of gage . . . unnecessary to work between gage and boiler. Conforms with A.S.M.E., Federal and State requirements when used for pressures specified by their respective codes.

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Duncan, Okla. . . . 2225
Tulsa, Okla. . . . 3-6143
Hobbs, N. M. . . . 275-R

Among the

Drilling Contractors

Loffland Brothers Co., contractor on the California Co. 1 Spears, near McKinney, in Lincoln County, Kentucky, was drilling below 4,600 ft. in what is said to be the most closely watched well in the Illinois basin area.

Harry H. Fox & Sons have been awarded drilling contracts on the L. D. and Bernice E. Gleason 1 Fee, in SW NE 29-10n-8e, and the Harry Knarr 1 Fee, in NE SW 28-9n-9e, Decatur County, Indiana.

Charles McMichael, Rushville, Ind., is contractor on the Chester M. Low 1 Fee, in SE SW 21-8n-9e, Jennings County, Indiana. Contractor will also drill the J. Frank Cargitt 1 Fee, in SW NW 1-11n-8e, Decatur County, Indiana.

Cox Drilling Co., Owensboro, Ky., will drill on contract the Ellis, Morrison & Bement 3 Phoebe Ann McAtee, in SE NE 27-1n-9w, Pike County, Indiana.

Ed Eads, Hazleton, Ind., is contractor on the Robert J. Hyatt 1 Warner Skelton, in NW SW 4-1s-9w, Pike County, Indiana.

George & Wrather Drilling Co. will drill three tests in Indiana on contract. These are the Black Hawk Coal Co. 2 Edith Marie Burkett, in NW NE 27-1s-12w, Gibson County; the Grace Hulman et al 4 Deep Vein Coal Co., in SE NE 27-1s-12w, Pike County, and the J. E. Bauer 1 Franklin Morris, in NW NW 34-2n-11w, Knox County.

E. F. Moran, Tulsa, has been awarded drilling contract on the Continental Oil Co. 78 Amanta Maier, in NW SW 12-3s-14w, Gibson County, Indiana.

Iron Drilling Co. is contractor on the Stanolind Oil & Gas Co. 1 Feathers, in SW SW NE 15-35-33w, Seward County, Kansas, which was drilling at 4,537 ft. This wildcat is 20 miles due west of Stanolind's Adams Ranch play, and is 2 miles south of Liberal.

Joe Cannon, Kermit, Tex., has contract for Seaboard Oil Co.'s 1 J. R. Randall, a wildcat in Section 257, Block 97, H&TC Survey, Scurry County, Texas. Location is 9 miles northwest of Snyder and on a block of 3,000 acres. Magnolia Petroleum Co. and Phillips Petroleum Co. own leases offsetting the drill site. Contract depth is 4,000 ft.

Interstate Petroleum Corp., headed by Emmett H. Jones of Los Angeles, has been organized for the purpose of drilling three Terminal wells on Parcel A, Los Angeles Harbor Board lease.

Standard-Fryer Drilling Co., Inc., formerly Standard Drilling Co. of Mount Vernon, Ill., has moved one rig to Bowie, Tex., on a 15-well contract for Reeves-Ely Laboratories, Inc., of New York City. Robert C. Hanson is in charge of tools and is living at Bowie.

T. & T. Oil Co., Yorba Linda, recently received contracts on five drilling operations. The contractor will redrill R. S. Lytle, Operator, 34-1C in the Coalinga field, Fresno County, California, and the other four jobs are for Standard Oil Co. of California in the Cat Canyon and Jacalitos fields, Santa Barbara and Fresno counties, respectively.

K. L. Kellogg & Sons, Long Beach, will drill Union Oil Co. of California 86-18 Cook, in the Coalinga field, Fresno County, California.

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OIL FIELD HAULING?
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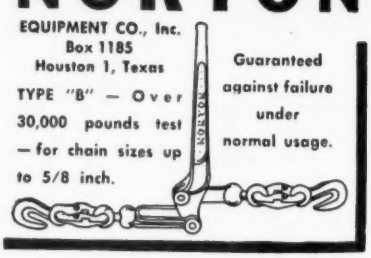

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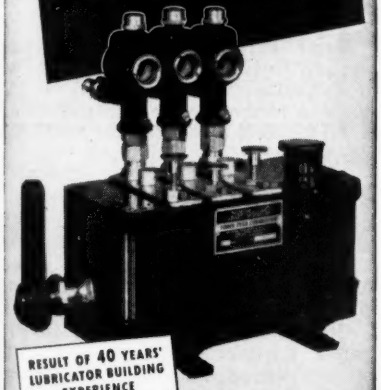


RESULT OF 40 YEARS' LUBRICATOR BUILDING EXPERIENCE

McCORD CORPORATION
DETROIT 11, MICHIGAN
LUBRICATOR DIVISION

Victory Oil Co., Long Beach, managed by Fred Crail, has received contracts to drill six wells for Long Beach Oil Development Corp. in the Long Beach Harbor field, Los Angeles County, California.

Crow Drilling Co. and Chastain 1 Young, in the Joseph Rice Survey, Henderson County, East Texas, was drilling ahead at 7,630 ft. and looking for the Rodessa pay. The well is in the Tri-Cities Rodessa gas-distillate pool.

Nelson Drilling Co. has been awarded contract on the Westgate-Greenland Oil Co. 1 Lundy, wildcat in SE SE SE 16-11-16w, Ellis County, Kansas, in the northeastern part of the county. Location has been staked.

Gibson Drilling Co., Los Angeles, has received contract to drill Signal Petroleum Co. of California 3 Callens, 18-6s-10w, West Newport district, Orange County, California.

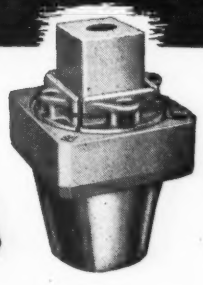
Olson Drilling Co. is drilling the Amerada Petroleum Corp. 1 Peacock, wildcat in NW SW NE 32-33-8w, Harper County, Kansas, which was drilling at 4,610 ft., in the Mississippi lime.

C. M. Morse, Long Beach, has been engaged by Bankline Oil Co., Los Angeles, to drill two wells in the Long Beach Harbor field, Los Angeles County, California.

George P. Livermore, Inc., has been awarded contract by Continental Oil Co. and Cooperative Refinery Association for the 1 Alston Unit, SE SE 20-7s-35e, Roosevelt County, Southeastern New Mexico. The contract calls for a 5,000-ft. test, although operators are considering plans to carry the well down to the granite if the San Andres zone is found dry.

L. F. Rojas and Jess Parker, drillers; and E. N. Mitchell, partner, Mitchell Drilling Co., Long Beach, photographed on location in the Huntington Beach field, Orange County, California

DRIVING TORQUE CUSHIONED WITH BJ KELLY BUSHING



Bushing Body is a solid, one piece unit with a corrugated inner core. An oil resistant synthetic rubber cushion absorbs the shock of drilling torque. Bushing is equipped with four slips inside the rubber cushion, faced with liners made of anti-friction material. These liners take all the wear and are reversible for long economical life. Ask the BJ man or see your supplier.

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Because of their unit construction and skid base mounting, you can move a YOUNG Drilling Engine with minimum trouble and do it quickly. When you get it on location, those same advantages help speed your set-up. No elaborate foundation is required. From then on your savings in time begin to pile up. No gears to shift— instant reverse with a single movement of the control lever. Brake sets automatically when clutch is disengaged. Ample power for fast pulling-out. On jobs where time is money, the time you save each day with a YOUNG Drilling Engine really counts.

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Heavy Duty Spudder

Young Engines Make Your Drilling Dollars Go Deeper

YOUNG ENGINE CORP.
CANTON, OHIO

PERSONALS

Texaco West Coast Manager Directed War Expansion

WHEN Bernard O'Connor graduated from Cornell University in 1913, he expected to make civil engineering his life's work, but he came to California and after investigating the possibilities of the petroleum industry there, he remained.

His business career started with Standard Oil Co. of California, and he served in different capacities at the company's El Segundo and Richmond refineries. In May 1925, he joined California Petroleum Corp. as assistant manager of its refining department. He remained in that capacity when the company was taken over by The Texas Co. in 1928, and in January 1935, was made manager of the refining department, Pacific Coast division, a position he now holds.

The Texaco properties under his management on the Pacific Coast include two refineries, one package terminal, five deep-water terminals, and the pipe-line transportation system. The two refineries were considerably expanded during the war, and additional facilities aggregating approximately $22,000,000 were installed. During World War 2, O'Connor served on the tanker subcommittee of the transportation committee, and also on the refining committee, District 5, Petroleum Administration for War. He was born in Watertown, N. Y., September 30, 1891.

J. A. Krug, secretary of the interior, will leave next week on a 15-day trip through six states in the Southwest and West, inspecting department projects and facilities. He will be accompanied by **C. Giraud Davidson,** assistant secretary of the interior; **Michael Straus,** commissioner of the Bureau of Reclamation; and **Joel Wolfson,** acting associate director of the Bureau of Land Management.

Oscar Lasse, assistant to the manager of the personnel department of The Texas Co., has been appointed manager of the personnel department, succeeding the late Charles O. Strahley.

John Parker, independent oil operator and formerly with Gulf Oil Corp., has opened an office at Evansville, Ind.

C. L. Lockhart, former marketing operations manager of the Cleveland, Ohio, division of Shell Oil Co., Inc., has been appointed manager of the company's Sewaren, N. J., plant. He succeeds H. V. LeBourveau, who died recently. **J. S. Morse,** assistant to the plant automotive manager in New York, succeeds Lockhart as operations manager in Cleveland.

O. W. McGinty, engineer for Great Lakes Pipe Line Co. has been transferred from Cushing, Okla., to Cameron, Mo.

George W. Stage, district land man of United Producing Co., will head the company's new office in Liberal, Kans.

H. R. Milner, president of Northwestern Utilities, Ltd., Edmonton, Alta., and the Canadian Western Natural Gas Co., Calgary, Alta., has been elected a director of the Toronto General Trusts Corp.

Gene B. Caperton, Shamrock, Tex., has been elected president of the student chapter of the American Institute of Mining and Metallurgical Engineers at Texas A. & M. College. **William B. Gill** was elected vice president; **Julio C. Casas, Jr.,** secretary; and **Gene M. Goodwin,** treasurer. **Professor R. L. Whiting,** of the petroleum engineering department, was chosen as faculty sponsor.

William J. Bond, independent operator in the Illinois basin for several years, has moved to Longview, Tex., to begin operations in East Texas and southern Louisiana.

O. H. Kristofferson, district geologist in Michigan for Skelly Oil Co., has resigned to enter geological consulting work with headquarters in Mt. Pleasant, Mich.

Alfred Lott, geologist, Pan American Petroleum & Transport Co., is in Caracas on a trip to Venezuela. Lott's headquarters are in Houston.

E. E. Clark, petroleum engineer of Phillips Petroleum Co., has been transferred from Oklahoma City to Eureka, Kans., and **Robert L. Hoss,** engineer at Austin, Tex., has been moved to Tulsa.

George W. Bean, fuel consultant for the American Gas Association, has resigned after 15 years' service to engage in individual utility representation work in Washington.

Wilbur E. Chalfant, field clerk for Ohio Oil Co. in West Texas, has been appointed personnel director of the newly created Houston division.

F. W. Covault, production superintendent for Amerada Petroleum Corp. in Fort Worth, has retired after 25 years' service.

W. F. Rickards, safety engineer in Lake Charles, La., for Shell Oil Co., Inc., has been transferred to Houston. **Joe T. Dickerson,** former general attorney for Shell in the Texas Gulf area, is now stationed in Houston as general attorney and assistant secretary on the regional staff of Shell east of the Rockies.

Don Miller, production superintendent at Amarillo, Tex., for Phillips Petroleum Co., will be transferred by the end of the year to Midland, Tex., to take over a new office for the company.

Carleton D. Speed, Jr., former superintendent of exploration and chief geologist for Plymouth Oil Co. at Sinton, Tex., has opened an office as consulting geologist in Houston.

Guy L. Tate has been elected director and vice president in charge of marketing, Magnolia Petroleum Co., Dallas, succeeding **George Miller,** who resigned due to ill health. **W. B. Rew** was advanced from assistant manager to manager of the marketing division.

H. O. English has resigned as executive secretary of the Rocky Mountain Oil and Gas Association to head the new oil-loan department of the Casper National Bank, Casper, Wyo.

Dr. R. R. Sayers, director of the Bureau of Mines; **Dr. William E. Wrather,** director of the U. S. Geological Survey, and **Roger Rhoades,** chief geologist of the Bureau of Reclamation, have departed for Rio de Janiero, Brazil, where they will comprise a part of the U. S. delegation to the Second Pan-American Congress of Mining, Engineering, and Geology.

J. W. Cole, formerly superintendent, Sabine Valley Gasoline Co.'s Kilgore, Tex., gasoline plant, will be the superintendent of Sun Oil Co.'s new natural-gasoline plant in the Delhi, Louisiana, field. He was succeeded at Sabine Valley by **Z. P. Armstrong,** recently returned from service with the Navy.

Clarence C. Warner, veteran landman for Stanolind Oil & Gas Co. in the Rocky Mountain area, has retired after 23 years' service. He has been succeeded by **John S. Schalk.**

Condon MacKay has been named secretary of Carter Oil Co., succeeding **Joseph Seger** who resigned to become general counsel of Interstate Oil Pipe Line Co. MacKay also has become assistant to the manager of Carter's public relations department.

R. O. Wilson, Ponca City, Okla., attorney and formerly Oklahoma district judge, has become a member of the legal staff of Continental Oil Co.

James H. Doolittle, vice president of Shell Union Oil Corp. and former commanding general of the Eighth Air Force, attended ceremonies in Centerville, Mo., last week at which the town was renamed Doolittle in his honor.

C. E. Heyns, Los Angeles, who served for a time as director of marketing for Petroleum Administration for War in District 5, has joined the staff of Coast Petroleum Sales Co. which is headed by **C. B. Garretson.** Garretson preceded Heyns as District 5 director of marketing.

John Hooton, supervisor of alcohol and "I" plant operations at the Bayway refinery, Elizabeth, N. J., of Standard Oil Co. of New Jersey, has been assigned to the employe relations department to supervise the foreman-training program. He is succeeded by **William D. Morrison. Lee W. Wagner,** training supervisor of the employe-relations department at the refinery, has been transferred to New York, and **Franklin G. Palcanis,** also training supervisor in the employe-relations department, has been assigned to Standard Oil Development Co. to assist in the preparation of contracts for new refinery construction.

E. M. Tharp, vice president and general manager of Ohio Fuel Gas Co., was elected as a director and chairman of the publicity and advertising committee of the American Gas Association at the annual convention in Atlantic City, N. J., last week.

Dr. William L. Russell, research geologist for Stanolind Oil & Gas Co., has joined the geological department of Texas A. & M. College. He formerly was assistant professor of geology at the University of South Dakota.

Stuart Morgan, secretary and director of Near East Development Corp., is now on a business trip to the Middle East and not expected back in the United States until the middle of November. The Near East company is a partner in Iraq Petroleum Co., Ltd.

C. W. Hamilton, vice president in charge of foreign operations, Gulf Oil Corp., and **C. M. Crebbs,** president of Mene Grande Oil Co., S.A., Gulf subsidiary in Venezuela, were in Bogota recently.

W. P. Williams, Pan American Production Co. engineer, has been transferred from Houston to Dickinson, Tex., and **Howard A. Gibson,** geologist, has been moved from Abilene, Tex., to Houston.

Earle White, of Delta Oil Co., Petersburg, Va., has been elected president of the National Oil Marketers' Association, succeeding **Roy W. Blair,** of Lincoln Oil Co., Troy, Mo. **R. J. Coughlin,** of Westland Oil Co., Minot, N. D., has been named vice president.

William M. Buccina, foreman at the Bayonne, N. J., refinery of Jersey Standard, has been promoted to general foreman of the paraffin-compounding department, succeeding **John J. Gavin,** retired. **M. Ritchie Smith,** engineer of the process-engineering group of the Esso engineering department, has been transferred to the personnel department of Standard Oil Development Co. where he will supervise technical-training activities.

Dr. Louis S. Kassel, Universal Oil Products Co. chemist, has been transferred from the research and development laboratories at Riverside, Ill., to the company's Chicago office where he will be technical assistant to **Edwin F. Nelson,** vice president.

Ted Scott and **Hayden Irvin,** maintenance men in the East Central Texas district for Lone Star Gas Co., have been promoted to assistant district production foremen.

Jack C. Owens, Miami, Okla., has been elected president of the Petroleum Engineering Club at the University of Oklahoma. Other new officers are: **Ray Loper,** Cleveland, Okla., vice president; **Don E. Eley,** Kingfisher, Okla., secretary; and **Maurice Lewis, Jr.,** Sayre, Okla., treasurer.

K. B. Davidson, Humble Oil & Refining Co., has been elected chairman of the North Texas chapter of the American Petroleum Institute. Five new vice chairmen are: **E. S. Pennybaker,** Humble Oil & Refining Co.; **I. E. Curtis,** Tide Water Associated Oil Co.; **Paul Peters,** The Texas Co.; **Roland Gouldy,** Bridwell Oil Co.; and **Fred M. Griswald,** Reno Oil Co.; **R. G. Mallander,** Shell Oil Co., Inc., was elected secretary-treasurer.

Shifts

Irvin B. Murray, Jr., geologist, McCarthy Oil & Gas Co., Angleton, Tex., to Stephenville, Tex.; **George A. Grimm,** foreman, Seismograph Service Corp., Christoval, Tex., to Sonora, Tex.; **J. R. Reeves,** geologist, National Geophysical Co., Schulenberg, Tex., to Cisco, Tex.; **Jack Muckelroy,** engineer, Whitman Drilling Co., Houston, to Easton, La.; **Philip H. Lipstate,** engineer, Penetron Service Co., Houston, to Tyler, Tex.

Peter G. Burnett, engineer, Stanolind Oil & Gas Co., Pampa, Tex., to Greggton, Tex.; **George R. Rugger,** engineer, Phillips Petroleum Co., Phillips, Tex., to Topeka, Kans.; **O. J. Jantz,** foreman, Amerada Petroleum Corp., Franklin, La., to Alexandria, La.; **J. T. Humphries,** superintendent, N. H. Wheless Drilling Co., Hackberry, La., to Bastrop, La.; **E. J. Bruce,** superintendent N. H. Wheless Drilling Co., St. Francisville, La., to Vivian, La.

L. D. Griffin, superintendent N. H. Wheless Drilling Co., Natchez, Miss., to Columbia, La.; **V. R. Lay,** superintendent, N. H. Wheless Drilling Co., Ruston, La., to Pineville, La.; **Virgil J. Glenn,** engineer, Plantation Pipe Line Co., Doraville, Ga., to Weatherford, Tex.; **R. J. Hughes, Jr.,** geologist, Swan-Hughes-King, Mt. Vernon, Ill., to Austin, Tex.

A. W. Bricker, engineer, Plantation Pipe Line Co., Meridian, Miss., to Baker, La.; **S. Clark Lord,** engineer, B. F. Goodrich Co., Middletown, Ohio, to Akron, Ohio; **Johnny Auten,** superintendent, Nella Oil Co., Rock Springs, Wyo., to Odessa, Tex.; **A. C. Christenson,** superintendent, Stanolind Oil & Gas Co., Watonga, Okla., to Mexia, Tex.; **J. W. Frost,** foreman, Phillips Petroleum Co., Oklahoma City to Clemscot, Okla.

Equipment Men in the News

Taylor Elected Executive Vice President of Lincoln Electric Co.

C. M. TAYLOR

C. M. Taylor has been elected executive vice president of The Lincoln Electric Co. by the board of directors, it is announced by J. F. Lincoln, president of the company. Taylor has been with The Lincoln Electric Co. since 1916. He was placed in charge of the company's time-study and methods department, advanced to assistant superintendent and then superintendent. In 1928, he was appointed vice president in charge of sales and has served on the board of directors since 1927.

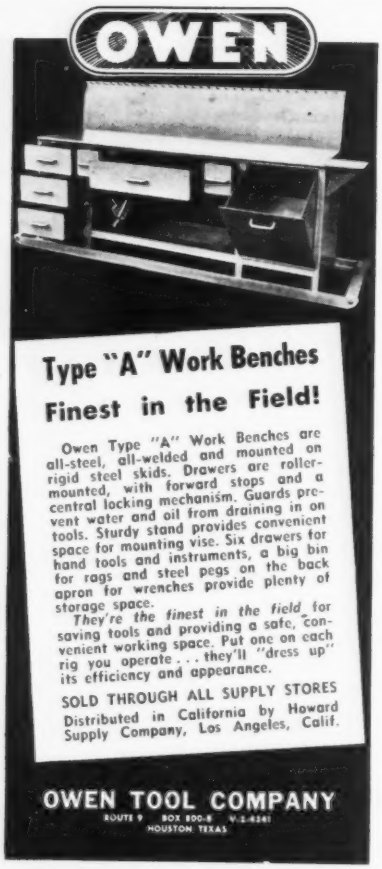
Parkersburg Rig & Reel Contracts For Nowery J. Smith Properties

Parkersburg Rig & Reel Co., Parkersburg, W. Va., has contracted for the purchase as of November 1 of the properties of Nowery J. Smith Co., Houston oil-field-equipment-manufacturing firm, according to an announcement by A. Sidney Knowles, Parkersburg president.

Knowles said the Houston firm will operate as in the past with all engineering, office, and plant personnel to be retained. Upon consummation of the deal, Smith will be named vice president of the Parkersburg company, it was announced.

The purchase contract covers all properties of Nowery J. Smith Co. except the commercial hot-dip galvanizing business which Tyson Smith will continue to manage under the name of Nowery J. Smith Co.

"In addition to the manufacture of products heretofore made under the name of the Nowery J. Smith Co., various other products of the Parkersburg line of oil-field equipment will be manufactured at the Houston plant in order to serve better the requirements of oil-field customers in Texas and adjacent states," the Parkersburg announcement said.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Finest in the Field!
Owen Type "A" Work Benches are all-steel, all-welded and mounted on rigid steel skids. Drawers are roller-mounted, with forward stops and a central locking mechanism. Guards prevent water and oil from draining in on tools. Sturdy stand provides convenient space for mounting vise. Six drawers for hand tools and instruments, a big bin for rags and steel pegs on the back apron for wrenches provide plenty of storage space.
They're the finest in the field for saving tools and providing a safe, convenient working space. Put one on each rig you operate . . . they'll "dress up" its efficiency and appearance.
SOLD THROUGH ALL SUPPLY STORES
Distributed in California by Howard Supply Company, Los Angeles, Calif.
OWEN TOOL COMPANY
ROUTE 9 BOX 800-B V-2-4241
HOUSTON, TEXAS

New Factory Completed

A new factory building is now in use for the manufacture of welding and cutting torches, regulators, and welding equipment, Fred H. Lewis, sales manager of Wall Chemicals Division of Liquid Carbonic Corp., announces. All manufacturing will be done in the new building, but sales and administrative personnel will remain at the main office of the parent corporation, 3100 South Kedzie Avenue, Chicago. The new building is at 1454 West Randolph Street. Floor space more than doubles that of the old factory on Jackson Boulevard in Chicago.

Hays Resigns as Oil Well Supply Vice President

George A. Hays, Jr., has resigned as vice president of Oil Well Supply Co., U. S. Steel subsidiary, a position he has held since 1939, according to an announcement by Fred F. Murray, president. Hays first entered the oil-field-equipment business in 1922, when he joined Wilson-Snyder Manufacturing Corp., Pittsburgh, which was merged with Oil Well Supply Co. in 1930. Hays went to Dallas in January 1936.

Dowell Enlarges Wichita District

Dowell Incorporated, through its general sales manager, R. D. Shaw, announces the enlargement of its Wichita district to include several western and southwestern Kansas gas-producing counties. This expansion requires the opening of an additional service point at Ulysses, Kans., and the operation of the long-established Hugoton station. This move has been made in order to consolidate service operations in the gas-producing areas of Kansas.

M. E. Hanson has been made development engineer with headquarters at Hugoton. He has been located at the Great Bend office of Dowell where he was a service engineer. M. E. Heslep has been transferred to Hugoton from the Wichita Falls district. He will be in charge of station operation. A. L. Herrell will remain at Hugoton as service engineer.

D. D. Parsons, who has been station manager at Hugoton for many years, becomes development engineer at Guymon, Okla., where a station is maintained as part of its Borger district. J. A. Cummin and W. F. Brown will continue to be district manager and district engineer of the enlarged district.

Poole Back in States For Short Stay

E. R. "Ray" Poole, manager of foreign service department for Security Engineering Co., Inc., returned from a 6½-month business trip in South America where he visited every oil-producing country on that continent. After a short stay in the states, he will return to South America where he will take up residence in Barranquilla, Colombia. From there he will make regular visits to all of the South American oil fields.

Watts Payne Opens Offices In Wichita and Dallas

Watts Payne-Advertising, Inc., Tulsa, has announced the opening of new offices in Wichita and Dallas. The Wichita office will be headed by Donald Schall, Kansas public relations man, who has been active in Wichita advertising for several years. Burke Gilliam, vice president of the Watts Payne agency before the war, has returned from military service and been named manager of the Dallas office.

Watts Payne, established in 1930, has over 50 accounts scattered throughout Oklahoma, Kansas, and Texas.

Shanklin Named Vice President of Carrier

Appointment of Arthur P. Shanklin as vice president and general sales manager of Carrier Corp. is announced by Edward T. Murphy, senior vice president. Effective November 1, Shanklin will be in charge of all of Carrier's domestic sales activities.

Kieffer Manager of Calco Chemical Division

William H. Kieffer has been named manager of the Calco Chemical Division, North American Cyanamid, Ltd., with offices and warehouses at Montreal and Toronto.

Cummins Engine Co. Makes Personnel Changes

L. W. BECK

Appointment of Leonard W. Beck as acting general sales manager of Cummins Engine Co., Inc., is announced by R. E. Huthsteiner, vice president, assistant general manager and controller. Beck's new responsibilities will be the over-all administration of the distribution division (sales and service). While Beck also will continue as manager of the company's central region, his offices will be at the factory in Columbus, Ind. Beck has been with the Cummins diesel organization since 1938, and, prior to his new appointment, was manager of the central region, with offices in Chicago, a position to which he was appointed in 1939.

Byron A. Duling, manager of the Cleveland region, has been assigned to the home office to work directly under Beck.

Corwin B. Briscoe has been appointed acting parts merchandising manager at Columbus. Other appointments are Norman E. Palmer as representative in Washington, D. C., and Fred W. Sparks as manager of the Cleveland region.